THE FARMER'S ADVOCATE.

averaged here lost close on a pound a box all round.

" ' The question of over-weight is such a mighty rare occurrence that it should not be taken into consideration at all.' "

Casein Manufacture at Beachville, Ont.

Among the less common by-products of the creamery is dry casein, a granular, yellowish-white substance, derived from the casein of milk by a process resembling cheesemaking in several respects. Casein is used in considerable quantities in manufacturing goods for the arts, in making glue for furniture dealers, and in a number of other ways. It is thus a commercial product of some importance.

The manufacture of casein has been carried on for some years in the creamery at Beachville, Ont., having been started by the proprietor, Mr. Jas. Ireland, who sold the plant subsequently to Mr. Thos. Huntsley, by whom some improvements and additions have been made, notably the drying room, referred to below.

The process, as described to us, is briefly as follows: The separator milk is run into a num-ber of cheese vats; a "starter" of whey, saved follows : from the previous day, is added, and the milk is raised to a temperature of 90° F. By the time the milk has been in the vats a couple hours, usually about 11 a.m., a small quantity of rennet is added-about 11 ozs. per 6,000-pound vat of milk. The renneted milk is cooked for a couple hours, to 102°, the curd being thoroughly raked meantime. The whey is then run off, leaving the casein curd in matted cakes. Any frothy stuff which may have gathered is rejected, and the curd is then pressed, remaining in the hoops over night. Next morning it is removed, and ground into pieces, varying from powder up to bits as big as a grain of corn. In this form it is taken to the drying room.

The drying room is a separate apartment, specially designed for the purpose. On each side of a central passage is a tier of metal pans, shelffashion. Blasts of hot air from pipes along the walls pour over the pans, on which the casein is spread. The drying requires some four hours, after which the product is conveyed to the storeroom floor and bagged.

The above system of utilizing skim milk leaves the patrons only whey to feed. This possesses some feeding value, although lacking the fat found in cheese-factory whey. The difference between the feeding value of the whey and skim milk is supposed to be made up to the farmers by the net returns from the casein, which they receive, less the cost of manufacture. They also receive the returns from the butter, except a charge of 4 cts. a pound to cover the expense of hauling the milk and making the butter. From each cwt. of milk is obtained about three pounds of casein, worth 7 to 8 cents a pound, netting the patron in the neighborhood of 15 cents per cwt. of milk, besides which he has whey worth, say, 7 or 8 cents, making a total equivalent of from 20 to 25 cents per cwt. of gkim milk. Whether this is more profitable to the farmer than separating at home and feeding the skim milk depends upon the kind of voung stock kept, and the skill of the feeder For calves and young pigs, the skim milk should be worth more as feed than for casein making. With shoats of 50 to 100 lbs. the case might be Again, some feeders make such reversed use of either whey or milk, giving it in bad condition and irregular quantity, that they realize very little from it. Such men would doubtless derive more money from the straight cash return of the casein. At present the Beachville creamery has a large quantity of unsold casein in store, though a market is expected to be found in Toronto. Hitherto the product has been disposed of locally. On the whole, we doubt if the average dairyman has anything to gain by his creamery embarking in the casein business, and we would certainly expect that one of the results of such a policy would be a deterioration in the cattle stock, either beef or dairy, raised in the district.

Pulleys and Belting.

The following rules for finding the size of pulleys, and the required length of belting, will be useful in fitting up a creamery, or in placing additional machinery:

To find the diameter of a driven pulley, multiply the diameter of the driver by its number of revolutions, and divide the product by the number of revolutions the driven pulley should go. The result will be the diameter of the driven pulley.

Example: Diameter of pulley on the engine, 40 inches; speed of engine, 160 revolutions; speed in main shaft, 200 revolutions; $40 \times 160 \div 200 = 32$, which is the diameter in inches required for the driven pulley.

To find the required size of a driving pulley, multiply the diameter of the driven pulley by the number of revolutions it should make, and divide the product by the revolutions of the driver.

Example: Diameter of the pulley in intermediate is four inches, which is required to run 900 revolutions per minute. Revolutions of shaft 200; $4 \times 900 \div 200 = 18$, which is the diameter in inches of the pulley required to drive the intermediate at proper speed.

To find the length of belt for any two pulleys, add the diameter of the two pulleys together, divide the sum by 2, and multiply the quotient by $3\frac{1}{4}$; add the product to twice the distance between the centers of shafting, and the result will be the required length of belt.

Example: Two pulleys are 8 and 24 inches in diameter, and 8 feet is the distance between the centers of the shafting; 8+24=32, $32\div2=16$, $16\times3\frac{1}{2}=52$ inches = 4 ft. 4 inches, and 4 ft. 4 inches + 16 (twice the distance between the centers of the shafting) = 20 feet 4 inches, which is the length of the belt required. -[O. A. C. Bulletin, 148.

GARDEN AND ORCHARD.

The Pear Blight in California.

By H. A. Crafts, Allendale, Calif.

The pear blight, which until about four years ago had confined its ravages to the upper part of the San Joaquin valley, has now spread to nearly all parts of California. Its attacks have not been confined to the pear; the apple trees have been attacked, and the orchards in the mountain regions have suffered quite severely. In the great pear-growing sections of the Sacramento Valley the growers have been indefatigable in their efforts to stamp out the disease. Vigorous cutting back has been resorted to, and the orchards have been carefully watched, and the disease has not been allowed to gain much headway.

The pear blight prevailed in Europe in the seventeenth century, and in the Hudson River valley in New York State in the eighteenth century, but was not very well understood until 1879, when Prof. T. J. Burrill, of Illinois, discovered that the true pear blight was of a bacterial nature, and is caused by a minute microbe, known as Baccillus amylovorus.

Much time and study have been given to the disease, but results of a practical nature have been wanting. The true or zymotic pear blight is now in nearly every pear orchard along the rivers in Northern California, and is seriously. threatening the very existence of the greatest pear-growing district in the State, that of the lower Sacramento valley. It has also seriously ravaged the counties of Kern, King's, Tulare and Fresno, in season to another in the bark of the tender shoots, not dry, where the diseased wood blends gradually into the healthy wood; and sap pressure in the spring causes the sap to exude with the germs. A single limb can infect a whole orchard. Tender twigs inoculated with the diseased cambium, or exuded gummy sap, have been known to blight in twelve to twenty-one days, blighting sooner in warm weather. The diseased cambium smeared on twigs did not produce blight, unless the twigs were pricked or bruised so that the bark was broken.

The best time to discover all of the diseased wood is in the fall, as the leaves of the blighted wood do not drop at once; but it is best to cut back just as soon as the disease makes its appearance. The best treatment thus far discovered is to destroy the microbes and render the tree as resistant to blight as possible. About the only way is to cut the diseased parts away, and destroy them by fire. After cutting out limbs, apply crude petroleum, or common coal oil, to the cuts, and wipe the shears used with a cloth moistened with oil. To each gallon of oil add a teaspoonful of carbolic acid.

As to preventive measures, it is recommended that all fruit spurs be taken off of the main trunk and larger limbs each season, leaving only the terminals to bloom and bear.

Vegetable Growers Organizing.

The officers of the Ontario Vegetable-growers' Association purpose organizing branches of the association in connection with the leading cities and towns of the Province. The constitution of the association provides for the formation of branch associations. The vegetable-growers in the vicinity of any town or city may organize a branch association, for which the membership fee is \$1.00. The presidents of these branch associations become directors of the Provincial Association, and have their expenses paid while attending meetings of its executive. The branch associations are expected to pay the Provincial Association 40 cents for each of their members, which makes all members of the local association members of the Provincial Association. The Provincial Association sends all its members copies of the annual report of its convention, and other printed matter. Vegetable-growers who would like to see one of these branch associations formed in their vicinity are invited to write to H. B. Cowan, Department of Agriculture, Toronto, Secretary of the Ontario Vegetable-growers' Association.

The association will receive a Government grant this year of \$800, which it purposes using to hold a large convention for vegetable-growers at the time of the horticultural exhibition in Toronto, next November, and also offering prizes for a large vegetable exhibit at this show. The prize-list for the show has been already completed.

Co-operation in Nova Scotia.

The fruit-growers of the Annapolis Valley have taken hold of the co-operative idea in a practical way. The fact that the business of apple growing and apple shipping is concentrated in the Valley gives them a better chance to carry out certain details of co-operation than that enjoyed by the fruit-growers in Ontario, where the orchards are comparatively small and somewhat isolated.

The Annapolis Co-operative Fruit-shipping Association consists of seven subordinate associations, organ-

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Your paper is one of the best of its that where it and one of the best mediums to adverture in formation stockmen that we know of. DUNNET HERON Haldimand Co., Ont.

Some one has suggested that create sections companies who are pushing the sales of bard a chines might very well furnish their subspace series of short instructions, not only are have use the separators, but to care for them as well e San Joaquín valley. ized

Zymotic pear blight first makes its appearance in the spring upon the blossoms. When the blossoms begin to shed their petals a few bunches may be observed to turn brown and to cease growing, presenting the appearance of having been frostbitten, or scorched by heat.

The spread of the disease, which now begins to extend down the fruit spurs, is at first slow. Many cases will remain dormant until several of the pears are quite large, and then begin as if they had been newly inoculated.

Usually after May 1st in California the disease advances very rapidly, running down the tender new twig growth to the larger limbs, and finally to the body of the tree. Sometimes this rapid march of the disease reaches the body of the tree the first year of attack. In many cases of blight in the lower Sacramento valley it was found that the disease had gone down the limbs in streaks from blossom to body of the tree, a distance of four feet, with only a few leaves killed. The blight germs rarely if ever kill the leaves. The foliage on the blighted limbs eventually dies. as the source of water supply is cut off. hot, dry spells of weather, and dry north winds. cause the leaves in such cases to die and turn brown, so suddenly as to give the appearance of a very rapid spread.

One of the most prolific causes of the continued appearance of blight is to be found in the failure to cut it back below all diseased wood. In hundreds of reappearing cases it was the original blight, crippled, but not killed.

The disease usually stops spreading in the Sacramento valley by the 15th of July; but in many cases, where the wood is soft and tender, it continues to grow all summer. The disease peries are thought to be carfied over from one

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ized under one head for selling purposes. Each of the subordinate associations has its own president and secretary, and will arrange the details incident to the collection of the fruit and packing of it in their particular neighborhood, while the selling and shipping will be especially in the charge of the central association. This seems a most admirable arrangement, inasmuch as it will secure the greatest possible degree of uniformity, and will give control to a very large output in one lot. It will also enable them to gather statistics of the probable output with greater accuracy than could otherwise be hoped for.

One somewhat unfortunate feature is the fact that they do not propose this year to establish central packing-houses in all the branches. This, however, is only the history of the successful Ontario co-operative associations, who in all cases started out with individual packing, but have very quickly seen the necessity of the central packing-house system, and no doubt the Annapolis Valley Association will soon develop that.

A. McNEILL, Chief, Fruit Division, Ottawa

Death to the Cutworm.

I saved my tomatoes from the cutworms this year," said Major Jas. Sheppard, of Queenston. ()nt., to a "Farmer's Advocate" man, "by using the Paris green bran mash. The cutworms were cleaning the tomato plants, and at the rate of from one to two hundred a night. pre pared the mash, and put about a teaspoonful at the base of each plant. It fixed them completely. and I just wish you could see the field now." Major Sheppard is one of the many who have had satisfactory experience with this remedy, yet many a farmer. lacking either knowledge or faith, suffers his crop to be devastated for the lack of this simple means of protection.