

9th. The casing prevents rats, mice, worms and everything of the kind from getting into the well, while it is impossible to keep them out of "the dug" well.

10th. A well can be drilled to any depth required and all surface and impure water cased off, and pure, healthy water procured from the gravel or rock below.

11th. In a great many cases a flowing well is procured, having all the advantages of the living spring.

Leguminous Plants.

A bulletin recently issued by the United States Department of Agriculture, on Leguminous Plants for Green Manuring and for Feeding, contains some exceedingly instructive information on this important subject. It concludes with the following summary, which will be read with interest at this time of year, when many are busy plowing in a weed crop on their summerfallow:

Probably of all the legumins, the pea is the only one suitable to cultivate in Manitoba, and, sown with oats (drilled cross ways), they can be cut on the green side with the binder, tied in small sheaves so as to dry through, and fed either with or without running through the straw cutter, make one of the best feeds possible for all stock, especially milk cows. The blue-lupin grows wild in some sections of Manitoba, but is a woody, bushy plant, and although cultivated in some parts of Europe, does not look as if it could be made profitable with us.

(1) Green manuring improves the physical properties of the soil by making the soil more porous and adding to its supply of humus. It brings up the dormant plant food from deep down in the soil, and deposits it near the surface, where it can be used by plants feeding near the surface.

(2) Green manuring with buckwheat, Hungarian grass and other non-leguminous plants, adds nothing practically to the soil which was not there before, except a mass of vegetable matter which decays and goes to form humus.

(3) Green manuring with clovers, peas, beans, lupines, etc. (leguminous crops), actually enriches the soil in nitrogen drawn from the air. These plants can grow with very little soil nitrogen. They store up the nitrogen of the air as they grow, and when plowed under, give it up to the soil and to future crops. It is the cheapest means of manuring the soil with nitrogen.

(4) But animals, as well as plants, require nitrogen for food. By feeding the crops of clover, cowpea, etc., only about one-fourth of the fertilizing materials of the crop is lost, if the manure is properly cared for. As the nitrogen of the air is the cheapest source of nitrogen for plants, so it is the cheapest source of protein (nitrogen) for animals. The leguminous crop is best utilized when it is fed out on the farm, and the manure saved and applied to the soil. The greatest profit is thus secured, and nearly the same fertility is maintained as in green manuring.

(5) For renovating worn or barren soils, and for maintaining the fertility where the barnyard manure is not properly cared for, green manuring with such leguminous crops as cowpea, clovers and lupines, is recommended. A dressing of potash and phosphates will usually be sufficient for the green manuring crop.

(6) The practice of green manuring on medium and better classes of soils is irrational and wasteful. The farmer should mend his system, so that the barnyard manure will be as well cared for as any other farm product. Loss from surface washing, leachings, fermentation and decay should be guarded against. Then, the feeding of richer food will mean richer manure, and better and cheaper crops.

(7) The system of soiling, or feeding green crops in the barn in place of pasturage, enables a larger number of the animals to be kept on a given area of land, and the manure to be more completely saved. For this purpose leguminous crops are extremely valuable.

(8) Hay from leguminous crops is about twice as rich in protein as hay from grasses. In the one case this protein (nitrogen) is obtained very largely from the atmosphere; in the other it is all drawn from the fertility of the soil. Leguminous crops yield larger crops of hay to the acre than grasses. Hence the production of food material on an acre, especially protein, is several times larger with leguminous crops.

(9) If allowed to ripen, the seed of the cowpea and soja bean furnishes an extremely rich, concentrated feed, which can be ground and fed in place of expensive commercial feeds. The straw remaining may be fed as coarse fodder, for it is richer than ordinary hay.

(10) Grow more leguminous crops. They furnish the cheapest food for stock and the cheapest manure for the soil. They do this because they obtain from the air a substance necessary for plants and animals alike, which costs, in the form of fertilizers and feeding stuffs, from fifteen to twenty-five cents a pound.

The following commissioners are investigating tuberculosis in New York State:—Mr. Frank E. Shaw, Dunkirk, a well-known member of the American Jersey Cattle Club; Dr. Florence O. Donohue, Syracuse, president of the State Board of Health; Mr. D. F. Wilber, the distinguished Holstein breeder, of Oneonta; Mr. Wm. O. Squires, of Marathon, long identified with the Red Poll interest; and Prof. James Law, of Cornell. Except the secretary, Mr. Donohue, these gentlemen are to serve the State without compensation.

DAIRY.

The Bothwell Dairy Company.

Some years ago cheese dairying was successfully carried on for a season at Bothwell, Ont., but the promoters of the enterprise unfortunately allowed it to lapse. That locality is peculiarly well adapted for the growth of pasture, roots and corn, and any grains necessary to supplement these are also grown in abundance. There is an ample supply of pure water and the roads are good. It seems strange that the dairy industry has not long ago taken hold under such exceedingly favorable circumstances, but the time has evidently now come when grain growing as a specialty is destined to give place to cheese and butter production, which to some extent is also likely to displace steer feeding, owing to the very unsatisfactory condition of that trade. Adjoining the town of Bothwell, as readers of the FARMER'S ADVOCATE are aware, was located the grand 600-acre farm, with some 600 acres a mile further north of the Geary Cattle (Polled-Augus) Company, which practically has been lying unproductive for years, though it has been used to some extent in connection with horse raising and for cattle grazing purposes. The persons chiefly interested in this property are Messrs. T. D. Hodgins and John Labatt, of London. The main barn and stables are very fine structures, providing stabling for some 200 head of cattle. Two large silos are to be put in this summer, about 40 acres of corn being grown for filling them. The water supply is pumped by windmill power, and just west of the barn stands the engine and boiler house, all complete, from which, in the barn, ensilage and other machinery can be run, and on the other side supplying power for the new dairy building. A few months ago it was decided to embark in this industry. Mr. S. O. Mason, an enterprising young man from near London, Eng., has taken a third interest with the gentlemen already named in this project, and will act as manager. A splendid dairy building, 105x30 feet, on a substantial brick foundation, has been erected. In the centre is the cheesemaking room, with capacity for five or six large vats, and to the south is the curing-room. Winter dairying is to be carried on, and the north end of the structure is set apart for buttermaking, etc., on the separator plan. The building is one of the best constructed that we have yet seen for this purpose. The farmers of the locality have not been asked to invest any capital in the project, so that if there is any risk the company take it themselves. It is proposed to make the cheese at 1½ cents per pound, patrons to draw their own milk, or for 2½ cents if the milk is collected and whey returned for them by the company. The milk will be paid for according to the Babcock test plan. It is expected that the milk of about 300 cows will be secured from the outset, the company putting on about 100. Hog raising will be an adjunct of the business, on a large scale. Mr. John Sheppard, one of the most progressive and successful farmers of this district, will this season turn in the milk of about 50 cows. His barn is well-equipped for dairying. The stabling accommodation is admirable, and he has in use two large, substantial silos. Up to the middle of June he had been feeding first-rate flint corn ensilage to fat cattle, of which he had altogether about 100 head. The meadows on Mr. Sheppard's farm and others in the locality were in grand condition, and his large, young orchard was certainly one of the most thrifty we have noticed for a long time. A number of others in the district will avail themselves of the advantages which this new factory puts within their reach and become patrons. By next season it ought to have a heavy patronage. As a cheesemaker, the Bothwell Dairy Company have secured the services of Mr. James Thompson, a thoroughly experienced man, who is also a buttermaker.

We must congratulate Mr. Hodgins and those associated with this enterprise upon the course they have taken in one regard, viz.:—In holding a dairy convention, in the Bothwell Town Hall, of those who are likely to become patrons, at which all the details of the business were carefully presented and practical dairying in its various phases discussed. If patrons are to do their part properly they must inform themselves thoroughly on all the details of the work, including the selection and breeding of cows, their general care and feeding, and more especially the winter management. It will be a good plan to hold further meetings of this sort. The one in question was favored with the presence of Prof. Jas. W. Robertson, the Dairy Commissioner, who was enthusiastically received. Mr. R. S. Hickey, ex-Mayor, occupied the chair, and addresses were also delivered by Mr. J. W. Wheaton, Secretary of the Western Ontario Dairymen's Association; Mr. Thompson, associate editor of the FARMER'S ADVOCATE; Mr. T. D. Hodgins and Mr. John Geary, of London; Mr. John Sheppard and Mr. S. C. Mason. This new dairy enterprise has certainly made an excellent start, with every prospect of success. It has given considerable employment to labor, has already begun to impart a healthful stimulus to agriculture, and in many ways should prove a boon to the locality.

The Work of the Dominion Dairy Commissioner.

As outlined a few years ago, the work of the Dominion Dairy Commissioner, Prof. Jas. W. Robertson, and his department, has been of a three-fold character:

1st. To extend co-operative dairying into those portions of Canada that seemed well adapted for it. 2nd. To bring the product of all up to a uniform standard of excellence. 3rd. To develop winter dairying. Operations are still adjusted to this general plan.

The work is all directed from the commissioners' headquarters at the Central Experimental Farm, Ottawa, where a great deal of experimenting is done relating directly or indirectly to dairy husbandry. Special investigations are being conducted in cream ripening, both as to the agent (ferments) in developing flavor and the degree. In hog fattening, as an adjunct of dairying, various feeding tests are going on, a mixture of ground rye, barley, wheat and bran soaked, giving the best results. Feeding experiments with cross-bred hogs and grades are also being conducted. Last year twenty-eight cows were successfully fed on the produce of forty acres, with the exception of some bedding and grain borrowed from the farm proper, but this was almost offset with a considerable quantity of silage left over. This year it is expected that thirty cows will be maintained on the forty acres, which was made up as follows: Twenty acres corn and beans, four acres sunflowers, four acres roots, eight acres mixed cereals and four acres pasture. An effort will be made, we might say incidentally, to establish as a Canadian industry the production of sunflower oil and cake. An immense quantity of dairy literature is circulated from Ottawa.

MANITOBA AND THE NORTHWEST.

The Dairy Commissioner has two travelling dairies at work in the Prairie Province and the Territories, planned to visit about sixty places, spending two days at each. Two men accompany each with a separator, tester and complete buttermaking outfit. The whole operation is exemplified, addresses given and questions answered. The meetings have been well attended, farmers coming as far as thirty miles in some cases. Messrs. J. A. Ruddick and Geo. Taylor are in charge of one and J. B. McEwen and L. A. Zufelt of the other. A dairy station has been established at Moosejaw, N. W. T., which, after a little help at the outset, will become a self-sustaining and profitable farmers' enterprise, just as has been the case in other provinces. Next year it is expected to have in operation four large creameries, under the Commissioner's direction, at suitable points on the C. P. R., the latter co-operating in the project.

PRINCE EDWARD ISLAND.

Mr. T. J. Dillion is in charge of the work under the Dairy Commissioner on this Island, where 17 dairy stations, two of them devoted to butter and the rest to cheesemaking, are running. Excepting the one at New Perth, they were all built and equipped by farmers themselves. Two of the factories are using the Babcock to divide the proceeds with the patrons. As showing how agriculture has been awakened on the Island, it is only necessary to mention that in 1890 there was but 10 acres of corn grown, while this year there are 5,000! In all three Maritime Provinces several silos have been constructed and all are giving good satisfaction.

NOVA SCOTIA.

There are now some 28 or 30 cheese factories in operation and several creameries. A number of new ones were started this season, the industry having received a great impetus. Mr. James Hopkins is in charge of the Experimental Dairy at Nappan, which early in the season was run for two weeks as a school for buttermakers specially, in addition to the regular work.

NEW BRUNSWICK.

Winter dairying was carried on at the Dairy Station at Sussex and some 30 makers were present for a couple of weeks receiving instructions, Messrs. Hopkins, Hubbard and Zufelt composing the staff. A travelling dairy is now at work, in charge of Messrs. Peters and Hubbard, who expect to visit about 70 places. Their plan will be similar to that carried on in the Northwest. The Dairy Commissioners' visit to the Maritime Provinces this month will awaken fresh enthusiasm.

QUEBEC.

A well-equipped dairy school, with a strong staff, was carried on at St. Hyacinth during the past winter, when no less than 268 students took a course in cheese and buttermaking, milk testing and the practical management of dairy farms. There was also a special course for the inspectors of dairy syndicates. Buttermaking will be carried on at the St. Hyacinth station this summer. Quebec has now some 800 cheese factories and about 130 creameries. The quality of the output of dairy products has greatly improved.

ONTARIO.

Operations in the Province are now confined mainly to developing winter dairying. Ontario has some 50 creameries and over 850 cheese factories in operation.

When, in addition to the above, the splendid work carried on by various Provincial Governments, through their Dairy Associations, with their travelling dairies, cheese instructors, etc., and such institutions as the Dairy School at Guelph, Ont., is all taken into consideration, that Canada should take front rank as a great dairy country is not to be wondered at.