

for heavier harness. For carriage harness, finish with a wet sponge and castile soap, using a chamois skin to dry with.

An old but very good recipe for making harness and leather blacking is as follows: Mutton suet, 2 oz.; beeswax, 6 oz.; white sugar, 6 oz.; soft soap, 2 oz.; powdered indigo, 1 oz. When all have been melted together and well mixed, add 4 oz. of turpentine. A good grease for heavy farm harness may be made as follows: Melt three pounds of clean beef tallow, melting slowly and not allowing to get hot; pour slowly into this one pound of neat's-foot oil, and stir until the mass is cold. Much depends upon this stirring; if done well the mass will become thoroughly amalgamated; otherwise the tallow will granulate and show white specks. It should be soft and smooth. Add a little bone-black to color it.

Commercial Fertilizers.

The fertility of the soil would remain practically unchanged if all the ingredients removed in the various farm products were restored to the land. This is, to a large extent, accomplished by feeding the crops grown on the farm to animals, carefully saving the manure and returning it to the soil, and if it is practicable to pursue a system of stock feeding in which those products of the farm which are comparatively poor in fertilizing constituents are exchanged in the market for feeding stuffs of high fertilizing value, the loss of soil fertility may be reduced to a minimum, or there may be an actual gain in fertility.

To keep rich land in its present state of fertility, or to, at least, farm so as to prevent an annual decrease in fertilizing elements, is a very important factor in successful agriculture, which, had it been observed fairly closely in the past, many now almost worthless farms would have still ranked with first-class lands that are profitable to their owners.

Changed conditions of farming, which have an important bearing upon this point, may be observed in two directions: (1) In the increased cost of labor and in the lower price of products, and (2) in the increasing demand for garden products and fruits of more refined character. For example, in growing wheat the labor of preparing the soil, of cultivation and of harvesting is practically the same whether the yield is 10 bushels per acre or 30 bushels. The same is true of a number of other crops; hence, in the larger yield the cost of labor per bushel is materially reduced. Meager crops of a relatively low value cannot be produced profitably with high-priced labor.

This fact has driven men to more extensive farming, or that of undertaking more land than can be anything like properly farmed, instead of the wiser and more profitable method of reducing the area under cultivation to what can be conveniently and properly handled. The result is the land is becoming poorer and dirtier from year to year.

When the most profit is to be made from land the maximum yield must be obtained, which can result only from the best possible mechanical condition, as well as the presence of the three essential elements—nitrogen, phosphoric acid, and potash—in available forms. The best mechanical condition can be obtained only when the area is within easy control and modern implements are used along with a wise rotation and the like. The method of determining the needs of a soil in elements is by growing a crop upon it with different kinds of fertilizers and noting the result. As a rule, however, one is inclined to look upon such experiments as something too costly and complicated for them to undertake, and consequently there is a tendency to use fertilizers or do without them in a haphazard manner, and in many cases, no doubt, at a great financial disadvantage.

In the older American States, where stock raising is not general, it has become necessary to use artificial fertilizers in order to get a crop. In this country they have not become so generally used except for garden crops, fruit culture and specialized intensive farming.

Prof. E. B. Voorhees, M.A., of the New Jersey Experiment Station, has prepared a bulletin upon the composition and use of commercial fertilizers, in which he shows the most desirable forms of the three principal fertilizing materials. Nitrogen, which can be most cheaply obtained by growing legumes, in the shape of clover, tares, etc., is the most expensive of all manures to buy, being usually incorporated with dried blood, dried meat, and other refuse of slaughterhouses, or in cottonseed meal and the like. It can be procured in more available form in nitrate of soda, sulphate and chloride of ammonia.

Phosphoric acid is best procured in the form of bone meal. The finer it is ground the sooner will it become available by the action of the atmosphere, etc., and boiled or steamed bone, when finely reduced, is readily taken up by plants. Phosphatic rock is also a source of phosphoric acid. It is finely ground and used largely in the manufacture of superphosphates.

Potash is largely derived at the present time from Stassfurt mines of Germany. The products obtained are manufactured into kainit, sylvinite, muriate of potash, and other preparations, all of which are readily available as plant food. Wood ashes also contain a large percentage of potash.

In answer to the question, Will it pay to use artificial fertilizers? Prof. Voorhees says that the profit from the use of fertilizers is measured to a considerable degree by the perfection of soil con-

ditions, which are entirely within the power of the farmer to control. Of course it does not follow that no returns are secured from plant food applied under unfavorable conditions, but it needs to be emphasized that full returns can not be obtained under such circumstances, either with or without fertilizers. Good plant food is wasted and the profit possible to be derived is largely reduced.

The very high prices paid by many for fertilizers, though admittedly due to their lack of knowledge concerning what constitutes value in a fertilizer, renders it impossible to secure a profit by their unsystematic use upon such staple products as wheat, corn, oats, etc., which absorb large quantities of manurial constituents, while these crops sell relatively low. The growth of potatoes, tomatoes, forage crops for the dairy, and vegetable crops for the market by the aid of fertilizers is more often attended with profit, because they usually sell well if of good size and quality, and are proportionately less exhaustive. The bulletin referred to concludes with the following summary:—

Commercial fertilizers are mainly valuable because they furnish the elements—nitrogen, phosphoric acid, and potash—which serve as food, not as stimulants.

The kind of farming in the past and the demands for special products in the present make their use necessary in profitable farming.

In order to use them profitably the farmer should know: (a) That nitrogen, phosphoric acid, and potash are the essential manurial constituents; (b) That the agricultural value of these constituents depends largely upon their chemical form; (c) That these forms are contained in specific products of a well defined character and composition, and may be purchased as such from dealers and manufacturers, and may be mixed successfully on the farm.

The agricultural value of a fertilizer bears no strict relation to the commercial value; the one is determined by soil, crop, and climatic conditions, the other by market conditions.

The ton basis alone is not a safe guide in the purchase of these commercial fertilizers. Fertilizers high-grade both in quality and quantity of plant food can not be purchased at a low price per ton.

The best fertilizers can not exert their full effect on soils that are too dry or too wet, too compact or too porous. They can furnish but one of the conditions of fertility.

The kind and amount to use should be determined by the value of the crop grown and its power of acquiring food.

A definite system or plan should be adopted in their use; "hit or miss" methods are seldom satisfactory, and frequently very expensive.

Handling the Turnip Crop.

To the Editor FARMER'S ADVOCATE:

SIR,—I thought the days of the grub axe and knife were past as far as harvesting turnips are concerned, but I see some advocate their use still. The plow is very good, but leaves too much dirt on them. I think our method is better, leaving the turnips clean and ready to pick up without having to knock off the dirt. We also took to saving the tops, which none of your writers seem to think anything about; but we look on them as being a very valuable food, if properly saved. Our method is this: Cut the tops off with a sharp hoe, throwing two rows into one. A boy (or man) goes along with horse and cart, gathering the tops with a fork and throwing them into the cart. When he reaches the end of the row he dumps his cart on any clean ground—a grass plot being preferable. He returns with another row of tops and dumps it at the other end of the field, or any place desired, being careful not to tramp or even put a foot on them after being dumped. When the tops are cut and gathered off, the harrow is used to take out the turnips. It may be passed over them as often as the operator thinks necessary to remove the dirt; a dull harrow being preferable to one with sharp teeth. If very dirty, they may lie a few hours to allow the clay to dry, when another stroke of the harrow will leave them very clean and ready to haul to roothouse or pit. The wagon is loaded from one side. On the other side of the wagon-box is put an extra board to prevent the turnips hopping over. In pitting, carts are preferable to wagons where the distance is short, as they are much handier to unload at pit. We prepare the pit as follows: With a wide plow the ground is plowed six inches deep, throwing the clay to both sides, finishing with furrow in center. With a shovel remove two sods on either side of the furrow, throwing the clay to both sides. This will leave a level, clean bottom for your pit. Sinking it in this way enables you to put in more turnips with less exposure. The pit is now ready to receive the turnips, which are put in as free from clay as possible, always picking or throwing them out of the cart or wagon by hand or with a grape; never dumping the cart unless it be in the bottom of the pit where the loose clay will reach the ground and not remain among the turnips. When the pit is full, pick up the sides, leaving them as even and straight as possible; have your pit high rather than broad and flat. Put on about six to eight inches of straw; spread evenly over the pit. Follow this with about three inches of clay; the clay thrown from the bottom of the pit being useful for this. The clay is put on to within eight inches of the top on either side; this being left without clay until

the second covering is put on. This light covering is all that is necessary until hard frost sets in, when a second covering of four or five inches is put on. It is an advantage if the first covering is frozen before the second is put on, as it assists in bearing the weight, thereby keeping it off the turnips. When putting on this covering, drain tiles or small wooden boxes are placed every eight or ten feet apart along the top of the pit. These may be stuffed with straw in very severe weather.

The tops are hauled to the stock and fed in the pasture or stable as the weather permits. They are fed to all kinds of stock, even to milk cows in moderate quantities. Young cattle relish them very much and, if properly fed, will thrive on them. By handling in this way none are lost by being trampled or dirtied. There is a lot of feed in the tops of ten acres of turnips if judiciously used. Our tops often last till well on in December if frost is not too severe.

I agree with Mr. Smith in his method of handling mangels. J. C. H. S.
Carleton Co., Ont.

DAIRY.

Branding Canadian Dairy Products.

A reader asks, "What has become of the Dairy Products Act, dealing with the branding of cheese, lately before the Dominion Parliament?"

In reply to this question it might be stated that the Bill originally introduced by Mr. McLennan, M. P. for Glengarry, was, at his request, taken in charge by Hon. Mr. Fisher, the Minister of Agriculture, who incorporated additional provisions and advanced it to a second reading, though Mr. McLennan strongly urged its final passage. However, the Minister being desirous of having it discussed at the various representative dairy gatherings this fall and winter before being made law, its final passage was deferred till the January session of Parliament, so that it may be made as nearly as possible a perfect measure. It provides that in the case of cheese the word "Canada," "Canadian" or "Canadienne," the date of manufacture (month and day), and the registered number of the factory (to be obtained from the Dairy Commissioner at Ottawa) must be branded upon the cheese itself in letters not less than three-eighths of an inch high and one-quarter of an inch wide; and upon the box the word "Canada," "Canadian" or "Canadienne," the month and the factory number. In case of butter the word "Canada," "Canadian" or "Canadienne," and the registered number of the creamery must be put on the box or package. Provision is also made for syndicate trade-marks for groups of cheese factories or creameries (not less than 15) united for the purpose of having the services of a dairy instructor and inspector. No factory salesman or other person will be allowed to sell, offer, expose or have in his possession for sale, cheese or butter made at any factory or creamery, unless branded as above stated. Severe penalties are to be enforced for violation of the Act, copies of which, together with the schedules to be filled out in applying for the registered number, may be obtained from the Dairy Commissioner or Minister of Agriculture at Ottawa.

Dairy Tests at Local Shows.

At the "Southern Fair," Brantford, on Sept. 24th, a milking trial was conducted, "For the best cow supplying milk to a cheese factory represented on the Brantford Cheese Board." Mr. Harold Eagle, of Attercliffe Station, and President of the Brantford Cheese Board, gave a silver cup (value \$40); to this \$10 cash was added, making a special prize of \$50. There were just two cows competing, both Shorthorn grades. Mr. J. R. Alexander, of Brantford, and a patron of the Cainsville factory, captured the prize. His cow gave (in 24 hours) 41.5 lbs. of milk, containing 1.726 lbs. of butter-fat. The other cow was owned by Wm. Nunnick, of Brantford, a patron of North Brant factory. This cow gave 26.5 lbs. of milk, containing .900 lbs. of butter-fat.

At the Ripley Fair, on Sept. 29th, another 24-hour test was conducted, for which three prizes were offered. The result was as follows:—

1st. S. T. Jackson, Ripley; Jersey cow, 37.5 lbs. of milk, containing 2.063 lbs. butter-fat.
2nd. Dr. McCrimmon, Ripley; Jersey grade, 21 lbs. of milk, containing 1.039 lbs. butter-fat.
3rd. Mrs. Irwin, Ripley; grade cow, 26.25 lbs. milk, containing .907 lbs. butter-fat.

The above trials were under the supervision of Mr. T. B. Miller, Instructor for the Western Dairymen's Association. Such tests are a feature of the local shows which hitherto have received little or no attention, but doubtless will in the future. They might be the means of effecting great improvement in the cows owned by the patrons of cheese and butter factories. We have no hesitation in commending the idea to township and othersocieties. A little healthy and properly directed rivalry of this sort between the patrons of different factories and creameries will certainly do good. There are throughout this country large numbers of cows capable of making highly creditable records, but which would never be found at the larger shows where these tests are usually carried on. The capacity of these cows will be accurately tested, so far as a one-day test is capable of doing it, and a host of people interested in the actual performance of their cows at the pail.