

Dr. Maria Montessori

remaining being thrown to one side and afterwards reduced and again added to the heap, which may then again be turned a couple of times. It is not always necessary to use the screen, but it is usually a great aid to thorough mixing. After completing the operation in this way, fill the material into the empty sacks and proceed with the next batch.

METHODS OF APPLYING FERTILIZERS.

Fertilizers may be applied either by hand or machine. Some modern grain seeders, potato and corn planters have an attachment for sowing fertilizer, and there are now some makes of broadcast fertilizer distributors on the market. Where large quantities of fertilizers have to be applied, the machine is a great labor-saver and by its use a more equal distribution is ensured. Generally speaking, we prefer the broadcasting machine to the drill, or to any of the other mechanical devices mentioned.

Broadcasting by hand is easily and simply performed by means of a sowing "hopper" or basket. This might be described as a crescent-shaped, canvas-covered frame with waist and shoulder straps attached. Both hands are used in the sowing operation and to obtain the proper rhythmical motion, it is important to note that the right arm is swung backwards from the hopper as the right foot advances, and vice versa. The length of the stride can be adjusted to the thickness of sowing desired. The breadth of cast is usually about the width of four potato or turnip rows. Preparatory to commencing operations, the fertilizer sacks are placed at convenient intervals in the field; two men, or a man and a boy, can perform the work, one man doing the sowing and the other man or boy carrying the fertilizer in a pail from the sack to the sower.

The Broadcast Sowing Machine.—One of the most satisfactory distributors is of German manufacture, and several are now being used in Canada. The machine is made in various sizes, but possibly the seven-foot width will be found the most convenient. The fertilizers are ejected from the box by means of a chain, which runs longitudinally. Each link of the chain has a projecting finger which sweeps the bottom of the box from end to end, so that the chain itself does not come in contact with the fertilizer. The machine can be adjusted to sow from 25 to 2,500 pounds per acre and its mechanism prevents clogging of the material, when damp, and evenness of distribution is guaranteed.

Broadcasting Fertilizers on Potato Rows.—When the sets have been planted in the row, a heavy log, about nine feet in length or long enough to take four rows, may be dragged by a horse over the rows so as to slightly flatten and partially cover the potato sets. The fertilizers are then sown and the rows closed. This method may also be used in the case of root crops. We wish it to be emphatically understood, however, that the application of fertilizers at planting time for such crops as described can only be recommended for moist climates. Under conditions which ordinarily prevail, in Ontario for instance, the fertilizers (potash and phosphate) ought to be applied much earlier in the season so that the spring rains may aid in their solution.

Broadcasting on the Level.—Whether in field or orchard, is an equally simple operation; the fertilizers should be harrowed or worked into the ground with a cultivator, except on sod, where cultivation is unnecessary. In the latter case, however, it is usually possible to apply the fertilizers rather earlier than on cultivated land, and they will thus have a better chance to get washed into the soil by the spring rains.

Broadcasting Versus Drilling.—For various reasons, which shall be stated, we generally prefer broadcasting fertilizers to sowing them in the drill or row, although the latter practice has something to recommend it, chiefly, however, in that it saves time by combining the two operations of seeding and fertilizing. Our arguments in favor of broadcasting may be presented thus:

(1) As broadcasting ensures a more thorough distribution of the fertilizers in the soil, encouraging a more extensive root development, which gives the plants a greater feeding area and, incidentally, promotes a wider distribution of humus in the soil.

(2) The crop succeeding that to which the fertilizers have been supplied will grow and ripen more uniformly. Take the instance of a cereal crop following a corn crop, where the fertilizers were applied directly in the rows or hills, and note the uneven growth: the old corn rows can, as a rule, be traced from end to end of the field.

(3) Broadcasting prevents an excessive concentration of fertilizers directly under the young plant, which, where very large quantities have been applied, might have an injurious effect.

WHEN TO APPLY FERTILIZERS.

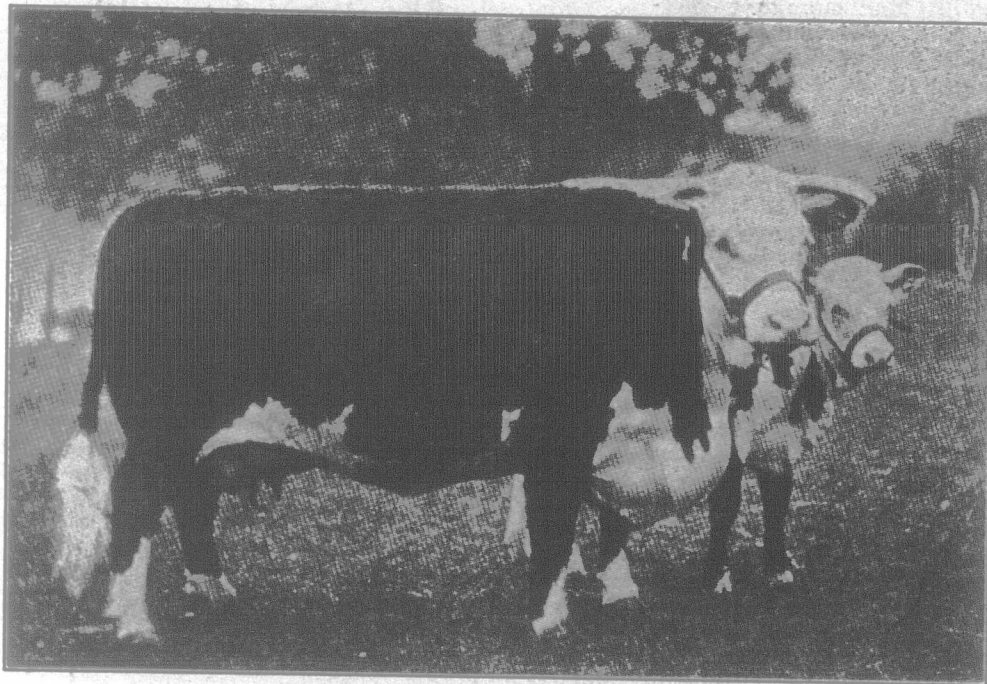
This will be determined by (a) the mature crop, (b) climatic conditions, and (c) the rate of availability of the fertilizer ingredients.

Nature of the Crop.—For hay and pastures the fertilizers may be applied as soon as the frost is out of the ground, and, indeed, for most other

crops, the phosphatic and potassic fertilizers might be advantageously applied as soon as it is possible to go on the land. For grain crops the fertilizers may be drilled in with the seed, where there is a fertilizer attachment on the grain drill. For wheat the phosphate and potash and part of the nitrogen ought to be applied in the fall. For fruit trees and bushes, the application of the potash and phosphate may take place before the ground freezes in the fall, or as soon as the frost leaves the ground in the spring.

Climatic Conditions.—In localities with a low rainfall the fertilizers ought to be applied as early as possible, in order that their plant food constituents may become available to the plants, when the latter are ready to make use of them. In moist climates the fertilizers need not be applied so early, and such very soluble nitrogenous materials as nitrate of soda should be used sparingly.

Rate of Availability.—In nitrate of soda, sulphate of ammonia and dried blood we have three nitrogenous fertilizers, placed in the order of the availability of their nitrogen. Dried blood is the slowest acting of the three, and is, therefore, better adapted for early application in mixtures with the other materials. Nitrate of soda is exceedingly quick acting and, therefore, ought not to be applied long before the crop is ready to assimilate its nitrogen. In its rate of action, sulphate of ammonia is intermediate between the two. It is often considered desirable in making up a complete mixture to put in certain proportions of two or more different nitrogenous fertilizers to ensure a more gradual and continuous supply of nitrogen. The special virtue of nitrate of soda is due to the fact that it provides a readily available supply of nitrogen to the young plant at a time when nitrification in the soil is only commencing.



An English White Face and Her Calf.

Likewise in acid phosphate, basic slag and steamed bone flour, we have three carriers of phosphoric acid, placed in order of their activity. Basic slag and steamed bone flour, being slower in action than acid phosphate, may be expected to give best results when applied in the fall or very early in the spring. For late spring application acid phosphate is to be preferred unless on soils containing an excess of acid, where basic slag would be expected to correct the sour condition.

Both sulphate and muriate of potash are moderately quick in their action and suitable for spring application, although they lose nothing by being applied in the fall; in fact, if applied at the latter season, their potash would usually be more available for the spring-sown crop. Kainit gives distinctly better results when applied in the fall, as compared with spring application.

It follows then that, where it is found impossible to apply fertilizers early, those materials containing their plant food in most available form will be chosen.

(To be concluded.)

Nova Scotia Farmers' Association Convention.

The N. S. farmers met in annual convention at Bridgewater, Jan. 27-30, and put on a good program. The practical farmer is slowly going off the platform and the addresses are given more and more by trained experts from our agricultural colleges and stations. This is probably as it should be that these trained men should do the teaching of the association while the farmers attend to the prosecution of business. This convention was remarkable for the amount of work done of an executive nature. The evening meet-

ing for Thursday, 29th, was, as usual, devoted to welcomes, jokes and general sociability—participated in by mayors, members of parliament and other personages of greater or lesser note. The exhibition commissioners reported a successful exhibition, with about the usual entries and the usual deficit. Mr. Fraser, one of the commissioners, advocated the moving of the sheep and swine pens up nearer the entrance, since their present position away down in one corner of the grounds placed them out of the itinerary of the ordinary visitor to the exhibition. Mr. O'Brien pointed out that fancy trotting horses received large prizes, while steers and grade cattle, such as ordinary farmers would be likely to show and be interested in, got very little recognition in the prize list, and recommended that more money be given to the latter and less to the former.

The objection was made that the exhibition was held too many days, that it added to the expense of the show and to the expense of keeping the stock on the ground and added very little to the attendance or income. The general opinion was that four days, from Tuesday until Friday night was long enough, and this would allow exhibitors to leave home with their stock Monday morning and to be home again Saturday night. This discussion, though having no direct results, will probably result sooner or later in shortening the duration of the Provincial exhibition to one calendar week.

A discussion about better accommodation for attendants of the live stock resulted in a resolution asking the exhibition commissioner to provide temporary rooms for the men near the stables, so that the attendants might each have a small oil stove for cooking food and a chance to make up a bed, as now they have to sleep up among the rafters over the cattle in the cattle sheds. During the past year a provision of the

Federal Government had made it possible in sections where sufficient money or members could not be raised to form an agricultural society, that a live-stock association could be formed by ten farmers to whom a pure-bred sire would be furnished.

Under this provision, over a hundred pure-bred animals had been distributed in the province. It was felt that there was no need of two sources of distribution and a resolution was passed that steps be taken to have this live stock distributed under the direction of the Provincial Department of Agriculture.

The Legislative Committee of last year reported results from some ten resolutions passed at the last convention. Short courses in different parts of the Province were being put on, as requested. The provision for a combination of individual country exhibition grants to form a fund for a district exhibition was an act passed in line with the resolution asking for district exhibitions.

Other resolutions were that accommodation be provided for the education of women at the Agricultural College at Truro in the arts and sciences upon which housekeeping and homemaking depend; that a committee be appointed to make arrangements for better train accommodation to and from the Government Farm at Napan; that the Government be asked to so amend the tile-drainage act that farmers be able to borrow money directly from the Government without all the necessary red tape of working through the municipal council; that steps be taken to make possible more rapid and cheaper transportation of stock to and from exhibitions.

The election of officers resulted in the appointment of the following: President, Wm. O'Brien, Windsor Forks; first vice-president, A. S. McMillan, Antigonish; second vice-president, R. S. Starr, Port Williams; exhibition commissioners, H. S. Kennedy, Alma; W. W. Black, Amherst.

Mr. Trueman, agriculturist and live-stock husbandman at the Truro Agricultural College, gave a practical talk on the breeding of animals. While there were cases where dual-purpose cattle had been found profitable, success along this line was very difficult to attain, and it was better to take either the beef type or the dairy type and stick to it. For the amount of food consumed, the dairy cow produced more food for human consumption than the beef animal. However, if a farmer plans for a herd of dual-purpose cows