

The Ontario Agricultural Gazette

The Official Bulletin of the Dominion Cattle, Sheep, and Swine Breeders' Associations, and of the Farmers' Institute System of the Province of Ontario.

THE DOMINION CATTLE, SHEEP, AND SWINE BREEDERS' ASSOCIATIONS.

Annual Membership Fees:—Cattle Breeders', \$1; Sheep Breeders', \$1; Swine Breeders', \$2.

BENEFITS OF MEMBERSHIP.

Each member receives a free copy of each publication issued by the Association to which he belongs, during the year in which he is a member. In the case of the Swine Breeders' Association this includes a copy of the Swine Record.

A member of the Swine Breeders' Association is allowed to register pigs at 50c. per head, non members are charged \$1.00 per head.

A member of the Sheep Breeders' Association is allowed to register sheep at 50c. per head, while non-members are charged \$1.00.

The name and address of each member, and the stock he has for sale, are published once a month. Over 10,000 copies of this directory are mailed monthly. Copies are sent to each Agricultural College and each Experiment Station in Canada and the United States, also to prominent breeders and probable buyers resident in Canada, the United States and elsewhere.

A member of an Association will only be allowed to advertise stock corresponding to the Association to which he belongs; that is, to advertise cattle he must be a member of the Dominion Cattle Breeders' Association, to advertise sheep he must be a member of the Dominion Sheep Breeders' Association, and to advertise swine he must be a member of the Dominion Swine Breeders' Association.

The list of cattle, sheep, and swine for sale will be published in the third issue of each month. Members having stock for sale, in order that they may be included in the Gazette, are required to notify the undersigned by letter on or before the 15th of each month, of the number, breed, age, and sex of the animals. Should a member fail to do this his name will not appear in that issue. The data will be published in the most condensed form.

F. W. HOPSON, Secretary
Parliament Buildings Toronto, Ont.

HUMUS IN THE SOIL.

By D. Z. GIBSON.

Humus is any animal or vegetable matter which is in its intermediate stage of decomposition. In prairie soils, where the grass has not been removed for centuries, and where each season's growth goes back to the soil, it is found in great abundance. In fact, humus constitutes a large part of the almost inexhaustible fertility of such soils. In newly-cleared lands it is found in varying amounts, having come from the partial decomposition of trunks, branches, roots and leaves of trees, and other smaller vegetation that may have sprung up. In some swamps it occurs in large quantities in the form of muck. In tropical climates, where the rate of decay is rapid, it is not so abundant as in temperate regions. As yet the chemical composition of humus is not well understood, nor has its functions and importance as a food for plants been clearly defined. Yet we know from observation and experience that it is of prime importance to the farmer. Continued cultivation for years has greatly diminished the amount of humus in the soil of this province, and the lack of this important element may account to a certain extent for the small crop returns and failure to get a good stand of clover. Chemists tell us that an average soil contains enough plant food to grow wheat at the rate of thirty bushels per acre for seventy years in succession without the addition of any fertilizer. Nature, however, is not so lavish with her treasures as to allow us to get this plant food in our grasp within the space of a few years. A great deal of it is locked up in an inert form, and can only be made soluble when surrounded by certain favorable conditions. It is the business of the farmer to furnish these conditions as far as he is able, and make use of whatsoever agencies he can in doing so. Humus is one of these agencies. It makes the soil more retentive of moisture. The early settlers can well remember that the spring

freshets never took the form of such destructive floods as occur at the present day. This change is largely due to the fact that the surface of the earth possessed more humus or vegetable matter in the form of moss, decaying logs, stumps, etc., which retained a considerable portion of the moisture that came from the rains and melting snows, thus making the descent of the water more gradual. D. J. Crosby, of the Michigan Experiment Station, conducted experiments which show the difference in soils to retain moisture. Samples of sand, clay, loam and muck were placed in pails, and after being thoroughly dried each was moistened with the same amount of water and exposed to a drying atmosphere. At the end of 97 hours the sand had lost all of its moisture. The clay after 197 hours lost 99 per cent. of its moisture; the loam 91 per cent. and the muck 62 per cent. At the same time the temperature of the sand was lower than that of the muck, but the superior retentive powers of the muck more than made up for the difference in temperature. Thus the muck soil which was richest in humus was the best retainer of moisture. Humus in the first five or six inches of a soil acts similar to a mulch, except that the effect is not so marked. Now since water is one of nature's greatest solvents, and since plants require—according to Hellriegel—325 pounds of water to produce one pound of dry matter, it is important that a good supply of humus be kept in the soil, so that the bad effects of a dry season may be somewhat lessened.

The presence of humus in the soil, if the other conditions are the same, makes it warmer. This increase in temperature is due to the fact that it is of a dark color, thus absorbing the sun's rays more readily than a lighter colored substance. All know that a black garment is much warmer in a bright sunshine than a white one. The fermentations of organic matter which go on in a soil containing humus also produce a considerable amount of heat. A few degrees of increased

temperature in a soil may not seem to be very important, but then it is remembered that the vital processes of plant life only begin after the temperature has risen above 45° to 48° Fahrenheit; we then see that a difference of two degrees may bring one soil up to the growing temperature, thus causing germination and growth, whilst in a cooler soil these changes would be less active. Humus facilitates nitrification, or the making of nitrates. This is a process of decomposition that takes place in the soil, in which the complex insoluble compounds are broken up into simple form available for plants. Those bacteria that play such a prominent part in the growth of certain plants work more vigorously when in a soil containing plenty of humus. The presence of humus in a stiff soil improves its texture very materially. It also lessens the damage done by the puddling action of rain falling upon it, causing it to bake, especially when the surface has just been pulverized at the time of seeding. The tendency of stiff soils to contract, causing great cracks or fissures to appear, which tear or break off many of the smaller rootlets, thus depriving the plant of its means of water supply when most needed, is diminished when sufficient humus is present. The stiff texture of a clay soil is perhaps its greatest disadvantage, and as it is a fact that humus makes it more easily tilled (at the same time bringing other advantages) it is especially important that the farmer working a stiff soil should, as far as circumstances will permit, keep up the supply of this valuable material. On the other hand, it makes loose and open soils more compact and less liable to leach out the plant food in solution. We have briefly considered some of the benefits derived from humus, enough at least to prove that the average soil must contain a sufficient amount in order to get the best yield at the least cost.

How are we to increase this element in those soils that are lacking? is the next question. Since circumstances vary so widely, no one method can be given that will apply in every case, but some one or more of the following may be found helpful. First—Plowing down clover or clover sod not only increases the humus but also augments the store of nitrogen. Second—Any grass sod turned under every four or five years. Third—Apply farmyard manure when fresh. Fourth—Where summer fallowing is practised in connection with the growing of winter wheat, winter rye may be sown in August or September on the field intended to be fallowed. Plow the rye under the following June. Buckwheat, because of its abundant root growth makes it valuable as a producer of humus in conjunction with a fallow. The cultivation of a fallow or a crop tends to diminish the humus, but this

cannot be helped, and, as humus is one of the agencies that enables us to get the most out of the land, we may have to restore it just as we would have to cultivate again for another crop. Cultivation also increases the nitrates which may be lost in the drainage water, if there is excessive rainfall and the land is liable to leach. This danger has led some to object to the bare fallow. If rye or buckwheat is sown it ceases to be a bare fallow, as those plants take up the soluble plant food and store it in their tissues in a form not liable to waste, which when plowed under and decomposed becomes soluble plant food again just at the time when the young wheat plants require it. Of course, should much rain fall during July or August, waste might occur, but usually dry weather prevails in those months in this province. Fifth—Sow rape after the oats or barley is harvested, and plow under in the fall. Sixth—Peas plowed under when in blossom increase the humus and also the fertility. In a climate where they will thrive lupines and vetches answer well for this purpose.

In conclusion, it might be said that any green vegetation, that would not become troublesome as a weed or interfere too much with the ordinary farm crops, will answer as a restorer of humus.

MEETING OF COMMITTEE TO REVISE RULES AND REGULATIONS OF THE DAIRY DEPARTMENT OF THE PROVINCIAL WINTER SHOW.

A meeting of the committee appointed to revise the rules and regulations of the dairy department of the Provincial Winter Show met at the Royal Hotel, Guelph, on Saturday, June 4th. Members of the committee present were: Prof. H. H. Dean, G. W. Clemons, G. E. Day, and W. E. Butler.

The clauses in which a change was made now read as follows:

(a) The following entrance fees will be charged, and must accompany each application for entry, for which accommodation will be provided: For each entry, with the exception of those designated "special," \$2.

(b) The age of dairy cattle will be computed to the 1st of August.

(c) Cows must all be giving milk, and the awards shall be made by the following scale:

10 points for constitution and conformation.

20 points for each pound of fat.

4 points for each pound of solids (not fat).

1 point for each 10 days in milk after the first 30 days (limit, 30 points).

(d) An affidavit will be required from each exhibitor in the dairy department stating the number of days his cows have been in milk, also stating that each cow is shown in her proper class, and that she is the ani-