great is this difference that in the New England markets nitrogen of the finest bone meal is worth 16½ cents per pound, while that in the coarsest is valued at 8½ cents, and the phosphoric acid is valued at 7 and 4 cents respectively, in the two grades given above. It is also well to remember, as stated in a report recently issued from the Experiment Station of Connecticut, that one of the cheapest sources of available nitrogen and phosphoric acid is now found in very finely ground bone How surely the developing light of modern science is chasing away the mists of ignorance that hung over not a few of the practices of other years, in the little use that was made of the home sources of fertility. We remember when the practice was common of throwing in a lot of bones around the root of a newly-planted grape-vine. Well, the custom was a little better than that of allowing the bones to bleach around the dog kennel, but how very much inferior to the practice of applying finely ground bone meal in preparing the ground for a grapery. When bone meal suitably ground is about double the value of that not so prepared, it is of vital importance that the former is secured rather than the latter.

In preparing seed grain for sowing it is important that the farmer by judicious winnowing sifts out all the small and light seeds. The size of seed has an important influence on germination. It has been found as the result of carefully conducted tests that large seeds, as a rule, germinate earlier than small ones, and that the germination is decidedly more vigorous. This is a matter that every farmer has very largely under his control, as seed is generally selected from stocks grown on the farm. There is no loss connected with the operation, as the small grains sifted out can be fed on the farm. It is well to bear in mind, however, that early germination is never so important as *vigorous* germination, and this is sure to follow the use of well-developed heavy seeds, the other conditions being right. Sometimes seeds that are immature, and therefore light, will germinate more quickly than those fully matured, but the blade sent up is delicate and lacking in vitality. Like the weak man carrying a heavy burden who hastens to get to the end of the journey, and so exhausts his strength, these immature seeds endeavour to send up a quick growth which they cannot maintain. Selection from the best and of the best, cannot but influence in a salutary manner the processes of plant growth, and so retard, if it does not altogether prevent, that constant tendency to deteriorate that seems to be the heritage of all kinds of cereals. Seed thus carefully selected and sown on clean soil properly prepared, must have an immense advantage over that selected simply from the common heap imperfectly cleaned, and sown in land it may be polluted with weed seeds, which from the day of sowing are prepared to fight for possession until the day of reaping.

The Cultivation of Mangolds.

It is not generally understood that nearly all the work of preparing the ground for mangolds should be done in Autumn, but yet it is so. Mangolds cannot well be sown too early in the spring after the ground has become sufficiently dry to work. If sown thus early the dampness that is in the ground at that season renders germination very sure, whereas the dry weather of later spring makes this very uncertain. It is a matter of prime importance, therefore, to have nearly all the work of preparation done in Autumn.

The mode of preparing the ground will vary some with the nature of the soil, but in most soils the following course of procedure will answer: Plough shallow just after harvest for the purpose of cleaning the land, and harrow soon after to promote new germination. If foul with thistles use the broad-share cultivator some weeks later. Then apply good barnyard manure at the rate of fifteen loads per acre, and plough deeply. In the spring plough again, and then form the drills unless the soil should be open and loose, in which case the drilling may be done after a good harrowing or cultivating. If the soil is leechy the manure should go on after the last ploughing in Autumn as a top-dressing. In this case ploughing in the spring before drilling will be a necessity in order to bury and incorporate the bulk portion of the manure.

If, however, the soil is stiff, the land had better be ribbed after the last ploughing in Autumn, and a subsoil plough run between the drills. In the spring these drills can be simply harrowed lengthwise with a light harrow and then the seed sown at once. The ground in this case will not be so easily kept clean as where it is ploughed in the spring, but owing to the early period at which the sowing is done much more time is given for this process, which fully counterbalances the other loss. Germination in the latter case is just about certain, and in strong soils the one difficulty in securing a good crop is to secure good germination.

Fertilizers, as superphosphates and salt, may be employed with much advantage on hungry soils. And salt renders excellent service on any soil. Indeed it may be considered almost a food for the mangold. It is to be regretted exceedingly that the salt combination has increased the prices so much that its use must of necessity be more restricted on the farm. The accursed ring which have drawn down upon themselves the execrations of all good men are fattening at the expense of the hard-earned tillers of the soil.

But to return to the mangolds. They will make good use of 400 pounds of salt to the acre. The simplest method of applying both the salt and superphosphate is just before forming the drills, when this is done in the spring; when done in Autumn the artificial fertilizers should be sown in the drill, and this may be done when the seed is sown. Horse-hoeing may be done with advantage as often as there is time for this. It should be done sufficiently often to keep the ground moist, and quite free from weeds. The mangolds may be thinned to from 12 to 18 inches according to variety, when about three inches high, and no weeds at any time should be allowed to grow.

The mangold feeds upon a wide range of soils, light sands and stiff clays being the least favorable to its growth, especially the former. Medium soils with just enough of clay to give them tenacity, and to provide mineral constituents and moisture are best. There are but few parts of Ontario where mangolds will not grow fairly well if only cultivated properly. Good crops of them can be grown on soils too heavy for the successful cultivation of the turnip.

Those living in clay sections, especially where the land is not well under-drained, will do well to prepare their drills in the fall. The soil in the drill is then reduced to a fine tilth by exposure during the first periods, and in this seed-bed, which is also warmed by the early spring suns, there is almost certain germination. Where this is not done the ground turns up cold and cloddy, and requires weeks of exposure before a like condition is induced, by which time it is too late to sow the mangolds.

It is a matter of much moment to the farmer on strong clays that he can grow mangolds. He cannot grow turnips, nor can he feel sure that he will get corn, but so long as he can get a good crop of mangolds he has an important adjunct in the rearing of good stock.

Soaking the seed from 24 to 48 hours prior to sowing facilitates germination. The seed thus soaked may be dried by spreading it on a floor, and when partly dry sprinkling it with ashes, sand, or powdered charcoal. Unless the seed is soaked the germination is likely to be irregular.

Attention should be given to the variety selected for sowing. In soils that are deep the long varieties give the best returns, but in those that are shallow or with subsoil very heavy the Globe varieties should be selected.

When harvested they should lie in the field in heaps a few days before drawing, and these should be covered with tops to protect from night frost. They are very susceptible to injury from frost, for which reason they should be harvested early.

It is a mistake to feed mangolds early in the season where this can be avoided. They improve with age up to a certain limit; the amount of sugar contained in them increases until they are several months old.

Increased attention should be given to the cultivation of the mangold. They are a grand food for milch cows, breeding ewes, suckling lambs, and sows both before and after farrowing. Where the cultivation receives sufficient attention growing them is almost equal to a summer-fallow for cleaning the land. Owing to their deep habits of growth they bring up plant food from the subsoil, and a crop of barley following them is almost sure to do well. The grass following the barley is likely to do equally well.

Artificial Fertilizers.

These fertilizers will of necessity be used more and more as the country grows older. The selling of crops from year to year with the constant depletion of fertility accompanying it will render this an imperative necessity. In the neighborhood of towns and cities artificial fertilizers must of necessity be the principal resource of farmers and gardeners, who, as a rule, sell the bulk of their crops off the place every year.

Years ago we took the stand that the first duty of the farmer in relation to fertilizers was to make the best possible use of all fertilizers made upon the farm, before any should be purchased from abroad. We have in no way modified our view in reference thereto, but we take it for granted that many of the tillers of the soil are thus provident, and still want supplies over and above this to enable them to grow the crops they are seeking. It is a matter of thankfulness that we have manufacturers of fertilizers in this country to supply in part at least the growing need, and moreover we have a reasonable guarantee that these are not adulterated, since we have an inspector whose duty it is to test these whenever samples may be sent to him.

The necessities of the New England States, because of the poverty of their soils in many parts, has led the farmers there to give much attention to the manufacture and use of artificial fertilizers, and the practice of many of the farmers purchasing the raw materials and