in reference to the plant, its *dominant or ruler*. It is therefore this preferred element that must be applied to it in a greater proportion than the other elements, all other things being equal.

PLANTS WHOSE DOMINANT IS NITROGEN

Nitrogen is the dominant of wheat, barley, oats, rye, of hemp, colza and rape, of beets and mangels, of fodder-corn and meadow-grasses (as distinguished from the clovers, of leafy vegetables (such as cabbages and kale), of bulbous plants (such as onions and tulips) and of ornamental herbaceous shrubs.

For such plants the following formula will be found useful: (1)

200 lbs of sulphate of ammonia;
400 lbs. of superphosphate;
200 lbs. of nitrate of soda;
150 lbs. of nitrate of potash;
300 lbs. of plaster.

For those plants that pass the winter in the ground, half the dressing should be given in the fall, unless there is danger of its being washed away as in the case of hill-sides. (2)

Halve thefore the manure-dose as follows:

AUTUMN.

200 lbs. of sulphate of ammonia;
250 lbs. of superphosphate;
80 lbs. of muriate of potash;
150 lbs. of plaster.

SPRING.

200 lbs. of nitrate of soda;
250 lbs. of superphosphate;
70 lbs. of muriate of potash;
150 lbs. of plaster.

The two will constitute a full manuring.

For spring-sown plants, nitrate of soda should take the place of sulphate of ammonia, and less should be used. (3)

PLANTS WHOSE DOMINANT IS PHOSPHORIC ACID.

Plants whose *dominant* is phosphoric acid are: maize for seed, buckwheat, turnips radishes, swedes, Jerusalem artichokes, roots, such as carrots, parsnips, &c., and flowering shrubs.

The formula for these is:

600 lbs. of superphosphate;
250 " of nitrate of soda;
150 " of nuriate of potash;
300 " of plaster.

PLANTS WHOSE DOMINANT IS POTASH.

These are: the vine, the *leguminosæ*, (such as peas, horse-beans, lucerne and the clovers, haricot-beans, sainfoin, vetches or tares, &c.) flax, perhaps potatoes and tobacco, fruit-trees and seed vegetables (what *are* the *legumes-graines*? ED.)

Let us give a few preliminary remarks.

The *leguminosæ*, pease and the pod-bearers, get nitrogen, in some way or other, from the air; it is then almost useless to offer them nitrogenous manure; so this formula will suit them:

| | |
|---|---|
| Superphosphate | 500 lbs. |
| Muriate of potash | 200 " |
| Nitrate of soda | 150 " |
| Plaster | 200 " |

Muriate of potash prevents the formation of starch in the potato and is also hurtful to tobacco. For these two plants, then, substitute potash in the form of nitrate or sulphate. Take this formula:

| | |
|---|---|
| Superphosphate | 400 lbs. |
| Nitrate of potash | 300 " |
| Plaster | 250 " |
| or: | |
| Superphosphate | 400 lbs. |
| Nitrate of soda | 260 " |
| Sulphate of potash | 260 " |
| Plaster | 250 " |

POTATOES.

1. Without manure.
2. With complete manure.

For *the vine*, fruit-trees, and ornamental trees:

| | |
|---|---|
| Superphosphate | 600 lbs. |
| Nitrate of soda | 300 " |
| Carbonate of potash | 450 " |
| Plaster | 300 " |
| Sulphate of iron | 300 " |

WITHOUT AND WITH POTASH.

The manure to be broadcasted over the whole surface of the ground occupied by the roots of the trees, that is, by the branches and dug or ploughed in.

SOME OBSERVATIONS.

*Note* — We have not mentioned sulphate of iron in most of these formulæ. In red soils, it seems useless; in white land, 300 or 400 pounds are, so to speak, necessary; in other soils, more or less can be used according as they are more or less white.

On meadows troubled with moss, 350 to 500 lbs. of sulphate of iron will destroy the moss. Harrow well after spreading.

SUBSTITUTION OF ONE MATTER FOR ANOTHER.

The above formulæ only treat of the matters usually employed; such as nitrate of soda, sulphate of ammonia, &c.

In practice, other equivalents may be substituted for these matters, such as may be more advantageous as regards price, freight, &c. It is the business of the farmer to keep himself informed on this subject, and to vary his combinations for the good of his purse and of his crops.

Thus, if any one has at his disposal nightsoil, liquid manure, &c., he can save the nitrate of soda. If he is in the neighbourhood of a foundry where *basic-slag* can be had, he should use that phosphate instead of using superphosphate or ground Carolina-rock.

THE PURCHASE OF READY MIXED FERTILISERS.

We have only hitherto spoken of the raw materials of fertilisers; supposing them to have been bought separately so that the buyer could mix them according to the demands of his soil and his crops.

This is, assuredly, the best way of proceeding.

But commercial firms sell these manures all mixed, quite ready for sowing. Beginners, who fear to make mistakes in the mixing and preparation of them, may at first use these thoroughly prepared manures; but they will very soon find out the advantage of mixing for themselves.

When the ready-made mixture is bought, the work of mixing has to be paid for, and one is much more likely to be cheated. The mixture may deteriorate pretty quickly, and after all, we shall not be able to give to the land just than quantity it requires of each separate element of fertility.

PRESERVATION OF MANURES.

*More advice.*— Do not buy saline manures too long before using them; keep them in a very dry place, where *no animals can get at them. They* are almost all poisonous, and the cattle take them simply for common salt.

SIDERAL CULTIVATION.

We have said that leguminous (pease, clover, beans, &c.,) absorb the nitrogen they need from the air. Thus, they enrich the land with the nitrogen by their roots, and by the stems and leaves that are left after harvest on the ground.

It is, also, not an uncommon thing to see a grain-crop go down—get laid—after a good clover- or lucerne-crop. In this case, there must have been a superabundance of nitrogen. This "getting laid" can be prevented by dressing the crop with phosphoric acid and potash, whereby the balance will be reestablished.

In buying artificial manures, you will observe that nitrogenous fertilisers are always the most costly. You can often replace them by clover, vetches or lupins, ploughed in green.

The manuring can be made complete by the addition of phosphates and potash, which will affect the green-manure-plant, as well as the grain-crop that follows it.

It is this green-manuring, completed by mineral manures, that is called *sideration* or *sideral cultivation*. (1)

A correspondent writes to us on this system:

"Plants belonging to the family of *leguminosæ*, especially clover, lucerne, and lupins, have the property of enriching the soil with nitrogen, not only by their *roots, stems and leaves*, as we remarked above, but still more because their roots, when the plant is in full vigour, act as intermediaries between the soil and the atmosphere.

"If a root of any of these plants be examined, we shall see that it bears several lumps, (like warts), which, seen through a powerful microscope appear to be full of little animalcules, otherwise called *bacteria*. It is these that fix the atmospheric nitrogen in the soil.

"All this has been throughly proved by most conclusive experiments on the white lupin, conducted by M Bréale. I only mention these experiments, for, to describe them would be going out of my subject.

"As to *green-manuring*, it should *only* be *employed by* those who understand the principles of its action.

"It has been found, indeed, that in heavy land, it answers better than nitrogenous manures, such as sulphate of ammonia, dried blood, &c., but, on the contrary, on light land, the last named fertilisers pay better, for M. Muntz found that in the former case, in heavy land, the nitrogen of the green-manure nitrified more easily than in light land.

"We may also grow, but as a stolen crop, certain plants that are greedy of the nitrates, those belonging to the *crucifere*, such as mustard, rape or cole, &c. The plants will hinder the loss of the nitrates from the soil, and restore plenty of nitrogenous manure to the land after they have been ploughed in green.

CONCLUSION.

Such, then, is the system of farming with chemical manures.

On the whole, you will see that it is simple enough; still it must be understood.

You see that with a judicious outlay, you can obtain a considerable increase of crop, that will cover all expenses and leave a profit behind it.

Combined with a wise selection of seed and a through cultivation of the soil, the well advised use of chemical manures constitutes what is called intensive cultivation. But more important still, is the blessing of the Creator on our fields and our toil.

(*From the French.*)

(1) For sugar beets, substitute 100 lbs of sulphate of potash for the 150 lbs of the muriate, do not give quite so much nitrate of soda, and add a fourth more of superphosphate. (No mention made of the amount of the phosphoric acid contents of the superphosphate! *Ed.*)

(2) We demur to the use of such soluble manures as sulphate of ammonia and superphosphate being used before winter in this climate.—*Ed.*

(3) For all crops, but especially for sugar-beets, make 2 or 3 sowings of the nitrate of soda, at intervals of 15 days. (Good for the sugar-beets, but the growth of grain-crops is so rapid in our climate, that there would not be time for the three or even two sowings *Ed.*)

(1) *Sidus* is the latin for a star: hence, the words *sideration* or *siderale*. What the stars can have to do with it we must confess that we do not know. *Ed.*

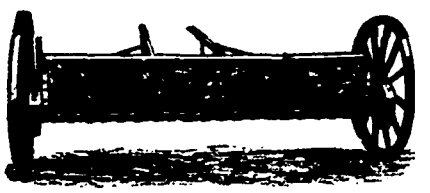
## Gypsum.

*Plaster.*—It seems, from several paragraphs we have lately met with in the English papers, that plaster, or gypsum, sulphate of lime in fact, has at present been found to be very useful to the clover-crop in England. Many years ago, in consequence of reports of its successful application to leguminous crops on this continent, it was tried by many farmers in England, but proved to be useless there.

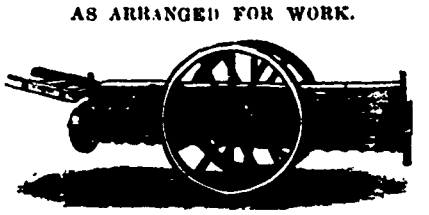
CLOVER.—Of this plant Gypsum is the indispensable, natural, and most favourite food, in which it delights to luxuriate. Upon a measured portion of young clover and other spring seeds, on a light gravelly soil, Mr. Long, of Bancroft, sowed the prepared Gypsum as a top-dressing in showery weather. Comparing the produce and growth of this portion with the remainder of the field, he expresses himself thus: "You have often seen a particular spot where a manure heap has been laid, its thickening and towering above everything around it: now that is exactly what the Gypsum has done." The best time for applying Gypsum to clover is April or May.—MARK LANE EXPRESS.

## THE MANURE DISTRIBUTOR

Adapted for all kinds of Artificial Manures, and specially suited for BASIC SLAG.



AS ARRANGED FOR WORK.



AS ARRANGED FOR TRANSPORT.