

Agriculture.

Necessary Plant Food.

We do "grope in the dark," not because we do not know what substances a plant needs for food from the soil: they are few and well known. But we do not often know what elements of food exist in certain forms or preparations of manures, nor their proportions or quantity, nor which of these already abound in the soil, nor in what condition they exist there.

No manure, in reference to the needs of various soils, is "best" or "worst." The best for this soil and this time may be the worst for another soil, or even for the same soil at another time. The value of a manure, to the soil, is in proportion to the absence of its ingredients from the soil at the time of its application. Additions of ammonia or potash may be not only worthless but injurious to the crop, and always wasteful when they abound sufficiently in the soil. Their value to a certain soil at a certain time has no relation to their commercial value. The commercial value is governed by their scarcity in the markets, while the agricultural value depends on their scarcity in the soil to which they are applied.

If a corn or wheat plant is to be grown in earth already containing sufficient ammonia and no lime, then lime is a cheaper manure for that soil at twenty-five cents per pound than ammonia at the same price.

We may grow as perfect a corn or wheat plant with its roots in water, containing necessary food for soil, under proper conditions, as in the ground. If we essay to do this with sufficient ammonia, phosphoric acid, potash, magnesia, sulphuric acid and iron, we cannot make a perfect plant. By the addition of these expensive substances we may only kill the plant, but the addition of a proper quantity of lime, without more of the others, will make a perfect plant. So here is a case in which a little lime is worth more than all other food, and the addition of the others is worse than worthless.

I planted alternate rows of potatoes in a loose garden soil, applying ashes in one, ashes and lime in another, lime alone in another, and nothing to another. The rows with ashes alone and with ashes and lime, produced less than the soil simple. That with lime alone produced the same as that with nothing.

This did not prove that ashes, nor ashes and lime, are not good fertilizers in general, nor that lime is worthless; but only that they were worthless, and the ashes injurious, to that soil at that time, for the reasons already stated, and perhaps the additional reason that the ashes rendered the soil still lighter, which was already sufficiently light.

The best manures, in reference to the needs of the soil, always do best, and the worst always do worst. In reference to commercial value, it is precisely as T. T. G. states: the most valuable sometimes does worst and least valuable best.

Analyzing Soils.

How shall we ascertain what manure is best, or what the soil needs? We have been told to analyze the manure and the soil. But to analyze the soil is worse than folly. Ascertain just as I did in reference to ashes and lime. No other way is known under heaven.

There is no royal scientific road to a knowledge of the secrets that God, in inscrutable wisdom, decreed shall be sought by labor and trials and disappointments.

Science is the expression of the results of experience, and no experience ever yet demonstrated that chemical examination of lumps of earth from a field discovers what is necessary to apply to the field for the growth of plants. All experience teaches that the plants, and they only, can impart the knowledge. If the chemist could examine all the earth of the field to the full depth to which the roots penetrate, he might approximate the percentage of the various sorts of plant-food it contains; but still his tests would fail to reveal the condition in which the plant-roots will find them.

The plant alone can reveal the truth as to what exists in available condition. Their growth and death is their only language intelligible to us. We must therefore try this, that, and the other, and note the various responses in the growth, vigor and weight of the crops, as a physician tries various preparations of food with emaciated patients. Not science, nor the physician, nor the patient, can foretell the result, but the stomach responds in

truth. The doctor may guess better than unskilled persons, so, a chemist, or intelligent farmer, may guess better, and have fewer experiments to try, than unskilled persons or fools. But under our present state of knowledge they can only expedite the practical processes, through which only the truth can be reached.—*American Farmer*.

Testing Seeds.

The Royal Agricultural Society of England employs a botanist, a part of whose duties is to test seeds belonging to the members. For this he has a fee of five shillings sterling, or about \$1.25 of our money. All that is necessary is to select a given number of seeds of the kind to be tested, promiscuously. Lay them between thick folds of cloth thoroughly saturated with rain water; place the same in an even temperature of say 60 to 70 degrees, where they may remain moist, and they should germinate in from two to three days. This will apply to all the cereal grains, and other seeds that germinate at a comparatively low temperature. Tomato, egg plant, cucumber and other plants should be kept at a heat of fully seventy degrees.

Thus one may easily learn the germinative power of seeds under favorable conditions, and calculate the per cent. of good and bad seed in the lot. Seeds that lack vitality are stimulated into growth by soaking them for a short time in slightly camphorated water. In this connection we may add that seeds containing much starch are more easily affected by changes of temperature, alternately moist and warm, and dry and cold. All such seeds should be kept through the winter continually dry, and not subject to extreme freezing. The neglect to do this is one of the prolific causes of some of our varieties of seed corn failing to germinate in the spring. Hence such grain should not be allowed to be in the crib or exposed to changes of weather during winter.

Beet Root Sugar.

For some years the FARMER'S ADVOCATE urged farmers and manufacturers to take measures for developing the manufacture of sugar from beet root. The development we have so long urged is now, we hope, nigh at hand. Farmers and others interested in the prosperity of the country have taken up the question in Quebec, Ontario and elsewhere throughout the Dominion. A large meeting was held a few days since in Berlin, of the leading farmers in Waterloo County, to consider this question. The Mayor, Mr. Krautz, on taking the chair, lucidly explained the objects of the meeting. The manufacture of sugar from beet root, he said, would give a stimulus to the agricultural interest of this country beyond anything that has ever been attained in the past.

Mr. Gemment, a practical manufacturer, traced the history of beet root sugar manufacture in Germany, and the difficulties and losses that capitalists and others had to contend with before the industry became successful; an industry, he said, which, ultimately established by the assistance of the Government, had become one of the most profitable sources of revenue to the country, besides developing the natural wealth of the soil, and providing employment for numbers who might otherwise find it hard to live. In manufacturing sugar parties investing their money in factories would have to depend altogether on the farmers for the production of the raw material, which production would be a source of direct profit to all engaged, and would enable the farmer to adopt a better system of farming by rotation cropping, as markets would be established for the sale of their root crops, and in his opinion there was no country in Europe, or in the whole world, so favorably adapted for beet growing as Canada, or could produce the same quality of beet for sugar purposes, or give the same yield per acre when properly cultivated. The importation of sugar into Canada amounted to \$10,000,000 annually, and was draining the country each year to the same extent. By the establishment of factories not only would this money be retained in the Dominion, but in the course of a few years Canada would be exporting sugar to the States and elsewhere, and thereby at once furnishing employment to all classes of the community, and forming a source of national wealth. But before capitalists could be induced to build factories and invest their money it would be necessary for

the Government to grant assistance, as had been done in all other countries where factories had been established. The sister Province of Quebec had already granted a bonus of \$70,000 in addition to other grants, making altogether about \$100,000, to assist this valuable undertaking, and he hoped that ere long the Government at Toronto would make a similar grant, but to a much larger amount, in the interest of the farmers of Ontario, who form the bulk of the taxpayers from whom the revenue is derived. As soon as the Government did their part, the capital was ready with which to commence operations, and the name of Mr. James Simpson, of Hamilton, was a sufficient guarantee for the money being forthcoming when required.

Messrs. Simpson, Rayner, Brubachen, Bowman, M. P., and Young, M. P., severally addressed the meeting and endorsed the views of Mr. Krautz. It was resolved unanimously that the object of establishing this industry is approved of by the meeting, and that there be a memorial to the Government drawn up asking them to grant a bonus to assist in the establishing of a sugar factory upon such conditions as the Government may deem necessary.

Liquid Manure.

The subject of the value of liquid manure in its application to crops, in field, garden and lawn is again freely discussed. Mechi, the London millionaire alderman, was among the first to apply it to field crops, and for this purpose prepared a great deal of expensive machinery and employed a great many men to do the work. His crops bore testimony to its great fertilizing qualities, and these returns Mr. M. was not slow in laying before the British public. His statistics were liberally quoted in this country, and he has a great many disciples—on paper—as those who adopted his method of applying manure soon abandoned it on account of its expensiveness. These disciples failed to see that in all Mr. Mechi's statements he made no comparison as to the relative expense of the two modes of application and the relative products. This was carefully omitted; and if we are correctly informed—and it looks as if the information is correct, as we have seen no recent statements from that quarter—the practice has been abandoned by the rich introducer, and it must have been from the fact that the old method of applying manure to land was the quickest and most profitable.

For small lawns and gardens—where the expense is a matter of no consequence—there is no mode of enrichment so certain and effective as liquid manure, for in these cases it can be applied with watering-pots commonly used by gardeners. For this purpose a basin should be dug from ten to twelve feet in diameter and three feet deep, which should be filled with stable manure, and either a conductor from a roof turned upon it—rainwater being the best—or supplied from hydrant or pump, the water being added gradually, so as to admit of the daily turning over of the mass. In a few days, or a week, it will be fit to use, and can be applied as the necessity may occur. In this limited way liquid manure can be used with great effect; but upon the farm it would take a mint of money to so dispose of it, whatever the beneficial results may be upon the crops.

The New Hampshire Agricultural College.

We have more than once referred to the fact that Agricultural Colleges in the United States have proved failures. They have not accomplished the purpose for which they were founded at a great expense to the country. They cannot be said to have educated young men in the science and practice of agriculture in number and proficiency at all commensurate with the expectations of those who supported them. From the *Mirror and Farmer* we take a brief extract of the working of the N. H. Agricultural College:—

The public debates, of which abstracts have been given, and the private discussions, which have been still more earnest and unrestrained, have all pointed to one conclusion: that the Agricultural College had thus far failed to answer the expectations of its founders and friends. As presented at this meeting, the facts are that the College has the best buildings for its purposes in the country. It has access to all the libraries, laboratories and other scientific appurtenances of Dartmouth. It has a cash fund of more than \$100,000. It has