

APRIL 6, 1911

THE FARMER'S ADVOCATE.

Nitro-culture for Legumes.

(Press Bulletin.)

During every season since 1905 the Bacteriological Laboratory of the Ontario Agricultural College has sent out to farmers and others cultures of bacteria for inoculating seed of alfalfa and other clovers, in order to aid in insuring a better catch of the seedling. The bacteria sent are of the kind which live in the small nodules or "knots" which are naturally formed on the roots of clovers, and which may usually be readily seen when a clover or alfalfa plant is dug up and the earth carefully broken away from the roots, so as not to break off the nodules. It is the business of these bacteria to draw upon the great supply of nitrogen in the air (about four-fifths of the air is nitrogen gas), and transfer it to the growing plant. Thus, by the aid of these nitrogen-gathering bacteria, the clover plant is able to get its supply of this most valuable fertilizing element, nitrogen, from the air, instead of having to depend upon what is in the soil. This explains the fact which every farmer knows, that clovers and other closely-related crops are such good soil enrichers. When these crops are plowed under, the extra amount of nitrogen which has been stored up in them becomes available for succeeding crops.

It is absolutely essential that the nitrogen-accumulating bacteria be present, in order that the storing of nitrogen in the clover plant be accomplished. If a clover or alfalfa crop has been successfully grown, as shown by thrifty, vigorous growth and the presence of plenty of nodules on the roots, it indicates that the necessary bacteria are already present in the soil, and ready to penetrate the roots as soon as germination of the seed occurs. In the case of a new or unsuccessful seedling, however, it is probable that the bacteria are not present, and they should be supplied by some method of inoculation. Experience has shown that the most satisfactory method of inoculation is to apply the bacteria directly to the seed before sowing. This is the method to be followed with the cultures sent out by the College at Guelph.

Last year there were 3,375 of these bacteria cultures sent to 1,881 farmers, and, of 771 who returned reports, two-thirds stated that the inoculation of the seed had aided in securing a better crop.

During the present season the College will send cultures for the inoculation of the following kinds of seeds: Alfalfa, red or mammoth clover, alsike clover, white clover, crimson clover, vetches, peas, beans, sweet peas. Each kind of seed requires a different culture. The cultures are sent by mail, with full instructions for their use. There is only one size package prepared, that being sufficient to treat sixty pounds of seed. There is a nominal charge of 25 cents for each package of culture, to cover cost of material and postage. Applications should state the kind and amount of seed to be treated, and should be addressed with enclosed postal note, stamps, or money order, to S. F. Edwards, Ontario Agricultural College, Guelph, Canada.

Use of the Saccharometer.

The saccharometer may be used to determine the density of the syrup, either while it is boiling or while it is cold. There is required a tin test tube or cup two inches in diameter, and nine and one-half inches deep, into which the syrup, hot or cold, is poured for the purpose of testing. The test tube is filled with the hot syrup, and the saccharometer is promptly plunged into it. If the syrup is of the standard consistency or thickness, it should settle at 30½ degrees. If the syrup is not yet thick enough, the instrument will dip deeper and register less than the 30½ degrees. If it is too thick, the instrument will dip less and register more.

If the syrup is tested while cold, before being poured into the test tube, it must be first brought to the ordinary temperature of a comfortable room; that is to say, 70 degrees F. This temperature is ascertained by means of an ordinary thermometer plunged into the syrup and left there, while the syrup cools down to 70 degrees F. Then this thermometer should be removed, and replaced by the saccharometer, which at that temperature should register 35½, if the syrup has reached the standard thickness.

Testing with the saccharometer is a delicate operation, and care must be taken that the tube and the saccharometer are not excessively hot or cold; otherwise that might unduly influence the temperature of the liquid with which they come into contact. Care must also be taken, in hot testing, to pour the syrup in while it is at the boiling point, and lose no time in introducing the saccharometer, as the density changes during the process of cooling.

When the saccharometer is not in use, it is well to place the instrument in a dish of lukewarm water, so as to dissolve the syrup which adheres to it, and leave it in proper condition for immediate subsequent use. J. H. GRIMM.

Salt and Land Plaster.

Editor "The Farmer's Advocate":

Your article on "Salt and Land Plaster for Barley," in March 16th issue, giving the results of Dr. Saunders' experiments with these fertilizers, prompts me to send you the results of some of our experiments. Some years ago we tried an experiment of spring wheat; the field contained ten acres. On one acre we sowed 200 pounds before cultivation of seed-bed; on another acre we sowed a like quantity after drilling; another acre we sowed after the plants were up; the rest of the field received none. There was no apparent effect until heading-out time. The first acre was out in head a full week before the rest of the field; the second acre, a little later; the third acre showed little or no difference from the rest of the field. At harvest the crop was all equally good, but the first two acres had much the brightest straw, and was the most evenly matured. Furthermore, the threshed grain weighed more.

We have on other occasions repeated the experiment, with the same results, viz., earlier maturity, brighter straw, heavier grain. I might say that our soil is heavy clay. We believe that it would always pay to sow it for barley, though we do not, for the reason that we seed clover with the crop. We are convinced of the good effect of land plaster for barley and clover seeds; but in this case, as with the salt, the effects are much more marked when sown and worked into the seed-bed before drilling. The reason probably is that, when sown on the surface after the crop is up, there is not sufficient moisture to make it effective. On one occasion we dressed a field of clover in the spring, all but about two acres, when we ran out of plaster. The season was dry and the crop fair, but not heavy. There was no noticeable difference in the field. The following season the field was sown to oats. The part that received the plaster showed a very marked superiority over the part that received none, proving either that the plaster was not in an available form for the clover crop, or that it had promoted a more vigorous root-growth, the decay of which had enriched the soil.

Land plaster is not used to the extent its merits deserve. One reason probably is that it is unpleasant to sow. We need badly a machine to sow it. When sown on clover or pasture, it should be done, if possible, before spring seeding, for the best results. FOYSTON BROS. Simcoe Co., Ont.

Sow Extra Mangel and Beet Seed this Year.

Permit me to intimate to your readers that, in order to abridge the danger of the partial failure of their mangel and beet crops, they will this year need to be particularly careful to ascertain the per cent. of seed balls capable of producing sprouts, and to adjust their seeders accordingly.

Because of the climatic conditions in 1909 and 1910 in those European countries from which we obtain our mangel and beet seeds, practically all the available supply this year is low in percentage of vitality. Our Canadian seed merchants have been doing what they could to procure seed that would conform with the provisions of the Seed Control Act, which fixes a standard of vitality for good mangel and beet seed of 90 per cent. of the seed balls, and 160 sprouts from 100 seed balls (what is commonly known as mangel seed is really a fruit containing from three to six small seeds), and the law is that when the percentage vitality falls below two-thirds of this standard for good mangel seed, then the seed must be labelled, showing the actual percentage of balls and of sprouts capable of being produced from the seed. All the seed inspectors now in the field have been notified to pay particular attention to the quality of the mangel seed exposed for sale; but the information and punishments to seed merchants resulting therefrom will not protect users of mangel seed this year.

There is no need for any farmer to reduce the area intended for planting to mangels, and he will suffer no danger from crop failure, providing that he will take the trouble to determine the percentage of seed balls capable of germinating, and increase the amount of seed per acre accordingly. In most cases it will be found that at least one-half more mangel seed than usual will have to be sown this year to secure a reasonably good stand of plants. Farmers should give the preference to mangel seeds put up by reliable firms, and not hesitate to procure seed of their favorite varieties from bags or packages on which the percentage of vitality is branded, even though that percentage would seem to be rather low.

GEO. H. CLARK,
Seed Commissioner.

THE DAIRY.

Excited a Wholesome Discontent.

Editor "The Farmer's Advocate":

We commenced the work of keeping cow-testing records four years ago. Our association was one that was organized in order to make use of Government aid along this line. Personally, we have never regretted our entering this work. Instead of being an irksome task, as many would have us imagine, it has proved interesting and profitable.

The time taken in weighing and sampling the milk of each cow three days of each month, as we do it, is never missed, but rather looked upon as time well spent at the end of each year. Had we a smaller herd, we would make a daily record of each cow. At the end of each month it takes but a short while in one evening to total up each cow's production, set it down opposite her number on the sheets furnished by the Dairy Division, of Ottawa, and place the sheets in the box of bottles containing a sample of each cow's milk. This is taken to our cheese factory, where the maker tests the samples, places the tests opposite each cow's number, and forwards the sheets, having the cows' production of milk for the past month, also her test, to the Department of Agriculture, at Ottawa.

The methods of keeping the records are well known to any who have studied this matter. A spring-balance scale, a box for bottles, a sheet for tabulating weights of milk, and a small spoon for dipping milk out of pails into bottles, are all the equipment necessary. The cost of these articles for a twenty-cow dairy will scarcely exceed \$3.00.

Someone may say, Why all this bother? Why not feed the cows, and dispose of your milk for all that you can get for it? Well, for one thing, I will answer: Why keep cows to milk at all, which means a lot of work that is unavoidable, unless you get the most from each one that you can, and how are you to be able to do this unless you know each cow individually as regards milk and butter production? And, further, how are you going to raise heifers which we all want to be better producers than their dams, unless, besides breeding to a pure-bred sire descended from a good milking family, we know which of our breeding cows is the best for milk and butter-fat?

At the end of our first year's work of testing we found we had some good cows, and some not so good. Our final returns from the Department that year showed us an average, for twenty cows and heifers, of 7,500 pounds milk and 250 pounds butter-fat. Next spring we kept our heifer calves from the cows that tested best the previous year, and this past season we had two- and three-year-old heifers giving us as much as what our supposed best cows gave us the first year we entered cow-testing work. In three seasons we raised our herd average from that just mentioned to 9,100 pounds milk and 300 pounds butter-fat. This was an increase of 1,600 pounds milk and 50 pounds butter-fat, which I am sure we would never have had if we had not tested, as we were well satisfied with our cows' performance previous to starting to test. Turning to the financial end, which is the important part to us all, we find an increase of \$14.50 per cow—i.e., 58 pounds butter, at 25 cents.

We read a lot to-day of the value of weeding, feeding and breeding to increase milk production all over this Province, but never did we realize personally the value of the first injunction in this oft-repeated text of our professors, dairy instructors, etc., to its full extent until we commenced individual testing of our own cows. We have also been stimulated towards the better feeding of our cows, the growing of crops necessary to the cheap production of large quantities of milk, as alfalfa, clover, and corn for ensilage. This whole business of milk production has been made more interesting by these instructive monthly returns from Ottawa.

Another important point: Buyers of dairy stock to-day are looking for these records; and if you have them to show, you can secure quite an increase in price over that obtained by your neighbor who does not test. Anything in the dairy line, from a three-year-old calf to a twelve-year-old cow, or older, has an enhanced value where these returns are down in black and white.

STATEMENT.

Cost of each cow's feed (average)	\$40.00
Return from factory and creamery (av.)	75.00
Profit	\$35.00

These returns are only the averages from the checks of a cheese and butter factory. They do not include value of skim milk, whey, and calf, which last item is considerable in a high-grade or pure-bred herd of Holsteins. C. E. MOORE, Peterborough Co., Ont.