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FARM NEWS

SOIL BUILDING WITH SOD CROPS

(Continued from Last Week)

Fertility Supply

A most important factor in the soil building program is the provision for an increasing supply of available plant food in the soil. Where there is an abundance of livestock manure available for the land, this problem is much simplified. Where crops are fed to live stock on the farm, about three quarters of the nutrients removed from the soil can be returned to the land in the form of manure. This manure has a two-fold value in supplying nutrients and organic matter. However, its effectiveness in supplying nutrients is due more to the quantities used, in even normal applications, rather than a high concentration of plant food in the manure. Also it should not be overlooked that manure from crops grown on poor soil will be poorer in quality and lower in plant nutrient value, than manure made from crops grown on good land.

If the fertility supply is to be built up rapidly, additional nitrogen and minerals may need to be provided from sources other than farmyard manure. Certainly, soil fertility must be maintained if the organic matter content is to be kept at a desirable level. Thus, in addition to the nutrients supplied by manure, the amount of other fertilizers used in the rotation will have a significant bearing on the maintenance of organic matter and humus as well as soil fertility. What we need is a balanced system of soil management in which provision is made for the return of both fertility and organic matter in proportion to the annual losses from the soil. Anything less than this must lead, inevitably, to bankruptcy of the land.

Desirable Soil Microbes

A healthy soil is one that is teeming with millions of micro-organisms or soil microbes busy decomposing soil and releasing available plant food. Fresh supplies of active organic matter, nitrogen, and mineral nutrients are necessary in a soil to provide food and energy for the desirable types of soil microbes.

When a soil becomes depleted of its organic matter and fertility, the population of its beneficial micro-organisms decreases, and the way is opened for more resistant and less beneficial types to flourish. While we cannot see many of these organisms without the use of a high powered microscope, sufficient is known about their activities in releasing fertility to convince us that without them the soil would indeed be desolate. The microbial population of a soil rises and falls with the rise and fall of organic matter and fertility. Furthermore, it is now known that soil microbes have a profound influence on the development of the granular or crumb structure in both light and heavy soils. We cannot ignore this vital part of the soil life in the soil-building program. What will be good for the soil microbes will be equally beneficial to the crops we wish to grow.

Sod Crops as Soil Builders

Hay and pasture as sod crops have not been fully appreciated. They have been the step-children in the crop family in America. They have not been properly grown, in the same sense as other farm crops. They have been left to themselves to grow on soils turned over to them because depleted fertility made cropping with grain, corn, etc. unprofitable.

In the Old World with its longer agricultural experience, the lands still in good production today are those occupied by sod crops for a large part of the time, where clean or summer cultivation has been reduced to the minimum.

Only now are we beginning to realize that through the more extensive use and proper management of hay and pasture crops, we have the most economical, effective and lasting means of increasing our food production, and at the same time maintaining the production of our soils. Sod crops range all the way from relatively pure stands of grass or legumes alone to various combinations and mixtures of both, but all have one characteristic in common—they can be made the best soil builders we have discovered to date.

The six main beneficial effects of sod crops that distinguish them as soil-building crops are that while they occupy the land: (1) the soil is rested from all cultivation, (2) organic matter losses are reduced to a minimum, (3) the humus content commences to increase, (4) the population of desirable soil microbes increases rapidly, (5) physical condition improves as a crumb structure begins to develop, (6) losses of plant nutrients by erosion and leaching are reduced to a negligible amount.

When the sod crops consist of the legumes, alfalfa and clover, or mixtures containing legumes, their subsequent beneficial effects on soil productivity reach a maximum.

Legumes are a superior source of soil organic matter because of their higher nitrogen content than the grasses, or any of the other crop residues. This is important from the standpoint of humus formation in the soil. We referred previously to the fact that more humus is produced eventually from material rich in nitrogen, than from material with a low content of nitrogen. The evidence indicates that more humus will be produced in the soil from the rotting of one ton of clover roots or tops, than from one ton of straw or corn stalks. This is shown by experiments conducted by the experiment stations in Iowa, Ohio, and Michigan.

To be fully effective as soil builders, the roots of alfalfa and the clovers must be thoroughly rotted with the bacteria which make it possible for these plants to use nitrogen from the air, and hence add to the supply already in the soil. When seeding down to legumes, it is good economy to inoculate the seed with the proper nitrogen-fixing bacteria to insure that the root nodule bacteria will be present.

The greatest effect on physical condition of the soil is to be derived from the deeper tap rooted legumes, viz., alfalfa and sweet clover. Not only do these crops improve the structure of the topsoil, but their deep root systems penetrate heavy compacted, impervious subsoils opening them up, and improving their structure, aeration and natural drainage to depths of 16 to 18 ins. The shallower, more fibrous rooted legumes, and such as also, red clover and ladino, are exceedingly effective in improving the physical condition of the surface layer, but have little effect on the subsoil. Grass sods of bluegrass, Orchard Grass and Timothy are also effective, mainly in the upper surface soil as far as adding organic matter and improving crumb structure are concerned. While sod crops particularly legume sod crops, have tremendous potentials for increasing the organic matter content and improving the physical condition of the soil they cannot accomplish this unless they are adequately supplied with nitrogen and mineral nutrients for their optimum growth.

Soils that are acid in reaction and lacking lime should first be limed to insure that sufficient calcium (lime) is available for alfalfa and the clovers. We are apt to forget that legumes have a much higher mineral requirement than the grasses or other farm crops. If we grow these successfully the required minerals (especially lime, phosphorus and potash), must be in the soil in sufficient amounts, and readily available forms at the time the sod crops are seeded down. The best insurance for this is to have the soil tested and apply agricultural limestone and phosphate-potash fertilizer as indicated to be required by the tests.

The evidence to date indicates that we need to apply much heavier applications of mineral fertilizers than we have been accustomed to for successful growth of the legume crops. Where grasses predominate, of course, the need for nitrogen fertilizer will be equally important in establishing a strong productive sod. Poor, thin sods neither produce much feed, nor protect or build-up the soil, for they become weed infested, killed out, and subject to erosion of the soil itself.

The capacity of sod crops to build up soils may also be increased by top dressing them with farmyard manure in addition to the initial dressing of mineral fertilizer. Manure, used in this way to stimulate the growth of the sod crop in the rotation will probably give, ultimately, a greater return per ton applied than when applied directly and plowed under for a cultivated crop.

In the stumping up, sod crops, in the form of well managed hay and pasture crops can be made real soil builders by:

- (a) having the soil tested to determine its lime and fertilizer need;
- (b) liming and fertilizing the soil as needed, to fit for the seeding;
- (c) using a suitable mixture of seeds of legumes and grasses adapted to the soil, etc.;
- (d) keeping the sod crop down for a longer period in the crop rotation;
- (e) feeding the sod by: (1) top-dressing with manure, as available and (2) top-dressing with suitable fertilizer as needed; harvesting the hay crop at the proper time; grazing pasture only within the limit of its carrying capacity; (3) controlling weeds in the pasture by clipping at the proper intervals; (4) following the breaking up of a sod and the growing of cultivated crops by putting the soil back into sod without delay.

GEORGETOWN

A meeting of the Georgetown Liberal Association held in the Town Hall last night, Lefroy Dale, K.C., re-elected the chairmanship of the Association in favour of W. G. Marshall after 27 years service to the party in either the capacity of chairman or secretary.

Baseball fans in Georgetown and District will have a team to cheer for this year. At a meeting held in the arena Monday night it was decided to enter a team in the Intermediate group which comprises teams from Hallow, Westworth and Wellington Counties.

An arrangement of early spring flowers formed the setting in St. Bartholomew's Church of England, Toronto, for the wedding of Norma Jean daughter of Mr. and Mrs. A. Honey, formerly of Georgetown, and Donald H. Ayres, son of Mrs. H. Ayres and the late Mr. Ayres. The service was conducted by Rev. C. F. Pascher.


After an illness of several months Stafford Benjamin Grant passed away in Toronto Hospital, Toronto, on Friday, May 8th. He was in his 64th year. *Herald.*

Canadians earning individually less than \$3,000 a year receive as a group, more than 90 per cent of the national income and own the majority of stock in Canadian enterprises.

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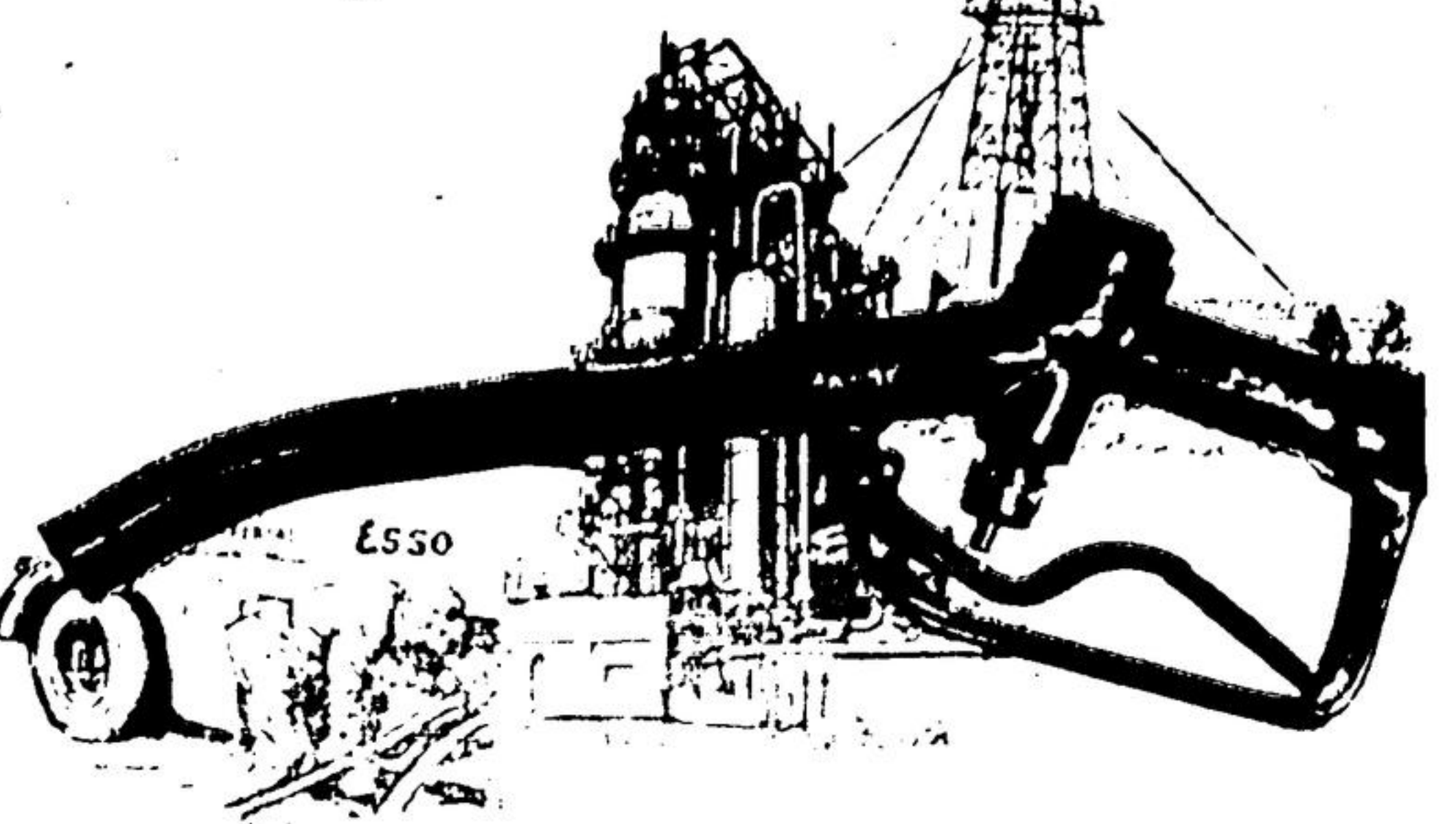
You already know that you can borrow money from this Bank under the terms of the Farm Improvement Loan Act, to buy new farm equipment, construct new buildings, buy new stock, or make any other worthwhile addition to your farm.

But did you know that this Bank can also make these loans to finance the purchase of used farm equipment, and to make repairs or alterations to existing farm buildings?

If you want to sell your old tractor to get a new one, and your buyer hasn't enough ready cash, ask him to discuss his problem with the Bank of Nova Scotia. Remember, if farm improvements will help to make your farm more profitable, we're interested.

THE BANK OF NOVA SCOTIA

A. W. Haydon, Manager, Acton, Ont.



There's a big investment behind the gas for every car

Finding oil and bringing it to you—in the kind of products you need, and at low prices—is a big job and takes a lot of money. Behind that dependable supply are thousands of Canadians engaged in finding, producing, transporting, refining and marketing—working with tools that cost hundreds of millions. But the investment in those tools is your guarantee of adequate supply and minimum price.

FIRST, the oil must be found. This means expensive equipment and the making of money in patent search. A single deep test drilling rig is worth half a million dollars and one unsuccessful well in the Alberta foothills has cost more than a million. Then when oil fields are found, they must be developed; just to drill and equip one well in the Leduc field costs about \$100,000.

SECOND, crude oil must be transported to a refinery. Tank cars, pipe lines and ocean and lake tankers are the vehicles. A large pipe line may cost \$100,000 a mile, Imperial's largest tanker, just put into service, cost more than \$5 millions.

THIRD, the crude oil must be refined into hundreds of useful products. Large and complex refining units are the workman's equipment here. To meet your increasing needs for more and better products Imperial since the war has added refining capacity to process an extra 31,000 barrels per day. The cost was more than \$30 millions.

FOURTH, the products must be marketed—this means they must be made available to you when and where you need them. The tools of the marketer are such things as service stations, truck fleets, coastal ships, barges, oil drums and tanks. This equipment, too, adds up to millions.

Canadians use twice as much oil as in 1939. To help meet your increasing needs Imperial has sought and found new fields, built ships and pipe lines, erected new refinery units, installed new marketing equipment. It costs more than twice as much to do those things as before the war.

The money we needed to do these things came from borrowing, from the sale of investments and from earnings put back into the business after paying dividends.

This money is helping to provide the tools to bring you all the oil you need—at the lowest possible price.

Bringing you oil is a big job—and a costly one.

IMPERIAL OIL LIMITED

If you're interested in facts...

The price of a gallon of gasoline today is about the same as the price of a gallon of distilled water.

For years before the war the wholesale price of gasoline dropped 50% steadily and although it has been caught in the general upswing of costs it has not increased nearly as much as other commodities.

Since 1939 the general wholesale price index has more than doubled but the petroleum products price index has advanced by less than two-thirds.

On its 1948 operations Imperial earned a profit equivalent to less than one cent a gallon for each gallon of products sold.