Soils and Crops

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When Corn Eats Most.

The results of recent experiments on the effect of a varying supply of nutrients at different periods in the growth of the corn plant are just reported. In this work corn was grown to maturity in large cylinders containing pure white sand. A standard nutrient solution was made and given to a part of the plants. Another solution of one-twentieth the strength of the standard was given to plants in other cylinders. The standard solution was sufficient to produce normal corn plants, while the weak solution was barely strong enough to keep the plants alive and produced very little growth.

At the end of thirty days' growth some of the plants receiving the standard solution were changed to the low ration while others receiving the weak solution were changed to the standard or optimum treatment. At the end of sixty days the solutions were again changed until all possible combinations of growing periods and strength of solution were obtained.

The results of this experiment show that plants having a good supply of plant food during the middle period of from the time the plants were thirty to sixty days old usually made the best growth. This period, therefore, is proved to be the time at which the corn plants need the greatest supply of plant food.

Where the plants had plenty of food during the first sixty days they would take up most of the mineral nutrients necessary for their development, only small additional amounts being required to bring them to maturity.

Where large amounts of plant food were present the stalks, leaves and ears were richer in protein and mineral matter than plants grown in the weak solution, but where excessive amounts of nutrients were present during the later stages the plants took up more than was necessary for their development and did not use the food materials economically.

Plants stunted by a limited food supply at the beginning of the growth period and then given a standard solution during the last sixty days produced shorter stalks, with fewer leaves, and the time of maturity was delayed ten to twenty days. They did, however, come out and produce good plants and fair ears regardless of the early stunting.

Plants having a low supply of nutrients near the end of the growing period produced larger and more fibrous root systems than those well supplied with plant food. During early growth where the supply of nutrients was low the weight of roots was greater than that of the tops. Where plenty of plant food was available the weight of tops was twice that of the roots. At the time of maturity the weight of tops was from three to seven times as much as the roots, depending upon the amount of available plant food.

A low supply of available nutrients increased the proportion of nitrogen, phosphorus, and potassium found in the roots over that obtained where a plentiful supply of plant food was present.

Corn plants that were normal in growth contained more than half of the nitrogen of the tops in the ears.

Turkeys as a Side Line.

The farmer who has sufficient acreage can raise a flock of turkeys with a reasonable investment in feed. The small farm is not a good proposition for turkey raising as the birds will range on the neighbors' land and frequently eat quite a large amount of grain. The farmer with a large acreage will often have a woodland and clover field just right for the foraging of turkeys.

Young turkeys need feeding about four times each day until they are five or six weeks old. After that they will follow the turkey hen in her foraging and pick up much of their living from the woods and meadows. Turkeys have a ravenous appetite for bugs and seeds and it is very expensive to raise them properly unless they have the advantages of a broad range. The feed for the young turkeys can at first consist of bread and milk squeezed nearly dry. Later rolled oats will be of benefit to the young birds. As they grow older wheat screenings and cracked corn can be fed two or three times each day. When screenings can not be obtained very good results are obtained from the commercial scratch grains such as are used for the laying hens.

When turkeys are strong and well feathered they will spend much of their time on the range and may wander far from the house. They should be encouraged to roost near home as a safeguard against thieves. If they are given only one meal a day during the summer season it should be at night, as this helps to coax them home to roost.

If the turkeys roost in a colony house it should be open clear across the front to insure a plentiful supply of air. Enough roosts must be provided to prevent overcrowding. If the roosting place is not satisfactory to the birds, their instinct will soon send them to the trees at night and then it will be very difficult to teach them to roost in any kind of a house. Some turkey breeders build a roof on poles and then cover the sides with fine-mesh wire. This keeps the rain from the birds but furnishes an abundance of fresh air. If such a house is closed at night it should be opened in the morning before starting to milk or do other farm work as the birds find their best hunting in the cool morning hours when the insect life is not so active as later in the day.

Turkeys are an asset on the farm that is troubled with grasshoppers as the amount of these insects which they will clean up in a few weeks is very large. Many of the losses in turkey raising are due to turning the birds on the range too early in life without giving them any grain to supplement the feed that they gather for themselves. When grain is high there is a temptation to cut it out of the turkey's ration, at least until fattening time. Young turkeys frequently receive no attention as soon as their crop seems to contain enough food which they have found on the range. A regular growth should be promoted from the time they are hatched. If young turkeys are stunted it is very difficult to bring them back into thrifty condition, even with the best feeding methods. Turkeys are discouraging to the farmer that endeavors to raise large numbers of them without work, but they are profitable in the hands of the grower who will keep vigorous unrelated breeding stock and feed enough grain to give the birds a chance to grow.

Poultry

The rooster is a very necessary part of the flock during the hatching season, but as soon as the last setting has been made his usefulness is ended and it is time to bid him good-bye. Roosters eat considerable feed during the summer and do not add to the egg production. This puts them in the same class with the cull hens and they should be given the same treatment.

At least ninety-nine per cent. of the roosters should be either sold or eaten as soon as the breeding season has passed and all others should be carefully penned away from the hens. Dealers are glad to buy discarded males and often pay a good premium in order to get them out of the country.

Only the exceptional rooster is worth saving for the next year's breeding pen. Yearling males are more active and give better fertility than the older birds and are to be preferred except by the man who is practicing line breeding. If a rooster is to be saved for the next year's breeding, then he should by all means be penned during the summer to keep him away from the laying hens. The infertile egg is the only quality egg in summer and to produce infertile eggs all mature males must be kept away from the laying flock.

Here are seven rules for getting the most money from the summer flock:

1. Produce infertile eggs by removing the roosters from the flock in the summer time.
2. Provide clean nests and keep the eggs clean.
3. Do not wash eggs.
4. Gather eggs twice daily during the summer to prevent them from being heated by the hen.
5. Keep them in a cool, dry place, away from the flies.
6. Market them at least twice each week.
7. Insist that they be bought on a quality graded basis.

Acts Affecting Agriculture.

Three important Acts relating to the agricultural industry were passed at the recent session of the Dominion Parliament. One is designed to protect and maintain Canada's export trade in dairy products. It provides that on the recommendation of the Federal Minister of Agriculture regulations shall be formulated for the grading of dairy products intended for export for the establishing of grading storages, for the issue of grading certificates, for the special marking of dairy products to be graded, for the establishment of standards, definition and grades of such products, for the arrangement of fees, for appeals to the Dairy Commissioner as to grading and for the appointment of graders and the definition of penalties. Another measure designates August 31, 1922, for the limitation of the manufacture or importation of oleomargarine and March 1, 1923, as the limit for its sale.

A third Act extends the period during which compensation shall be paid for animals officially slaughtered to prevent and check contagion to May 24, 1924, or for three years. At the same session appropriations for the purpose of agriculture, including the $1,100,000 divided among the provinces under the Agricultural Instruction Act, amounting to $6,649,214.50 were passed. No branch of agriculture is overlooked in the apportionment, but increased attention to the health of animals and to the purity of meat and canned foods is provided for.

Keep the cornfield clean.

United States Tariff on Agricultural Products.

History repeats itself. Prior to the civil war in the United States trade between that country and Canada, under the treaty of 1854, was practically free. This continued during the war and for some time after. Then the United States having recovered from the devastation caused by that great internecine struggle decided that protection was necessary against importations. The treaty of 1854 was abrogated or called off. A similar thing has happened now. The demand for foodstuffs from the United States has slackened consequent upon the ending of the world war, and to offset the result what is called an emergency tariff has been adopted. While the tariff is not in particular aimed at Canada it will naturally affect this country the most, as some figures officially promulgated at Ottawa abundantly prove. The articles most directly affected and affected to the greatest extent are: wheat, of which in 1920-21 we exported to the United States 42,324,894 bushels valued at $94,442,298, and on which a duty of 35 cents per bushel has been placed; wheat flour, of which we similarly exported 1,187,750 bushels valued at $12,023,090, and on which a duty of 20 per cent. ad valorem has been placed; potatoes, exported 4,204,684 bushels valued at $8,328,862, duty placed 25 cents per bushel; cattle not for breeding, exported 294,009 head, valued at $21,232,551, duty placed 30 per cent. ad valorem; meat, fresh or frozen, exported 430,142 cwt. valued at $7,740,443, duty placed 2 cents per lb.; wool, exported 7,128,065 lbs. valued at $2,094,693, duty placed 15 cents to 45 cents per lb. according to quality value; milk, prepared or condensed, exported 14,919,288 lbs. valued at $2,352,319, duty placed 2 cents per lb., and cream, exported 1,279,195 gals. valued at $1,987,461, duty placed 5 cents per gal. These are the principal agricultural articles of exportation from Canada to the United States affected, but a duty of 25 per cent. ad valorem is also placed on meat prepared or preserved, of 15 cents per bushel on Indian corn, of 2 cents per gallon on fresh milk, of 20 cents to 30 cents per bushel on flax, or 2½ to 6 cents per lb. on butter, of 20 to 23 per cent. ad valorem on cheese and of 10 to 30 cents per bushel on apples. Other articles of farm production are dealt with.

Queen of a Home.

Home is her kingdom, love her dower,
She seeks no other wand of power
To make home sweet, bring heaven near,
To win a smile and wipe a tear,
And do her duty day by day
In her own quiet place and way.

And round her childish hearts are twined,
As round some reverent saint enshrined,
And following her the childish feet
Are led to ideals true and sweet,
And find all purity and good
In her divinest motherhood.

This sad old earth's a brighter place,
All for the sunshine of her face,
Her very smile a blessing throws,
And hearts are happier where she goes,
A gentle, clear-eyed messenger,
To whisper love—thank God for her!

Commence fitting your live stock for the fall fairs at once.

During the twenty-one years that "Ben Hur" was being produced on the stage it is estimated that 20,000,000 people saw the play.

Cover Crops for the Orchard

BY EARLE W. GAGE

In most fruit-growing districts there is not enough barnyard manure to maintain the soil fertility, and some other method must be used. Cover crops add organic matter to the soil, and if they are leguminous crops, also add nitrogen. They do not altogether replace barnyard manure, but will do more toward keeping the orchard up to a high standard of production than any other one method we can use.

The maintenance of the productive power of soils depends in a large degree upon the upkeep of the vegetable matter in the soil. Humus is one of the last stages in the decomposition of the vegetable and animal matter in the soil, and its benefits may be summed up about as follows:

Effects of Good Drainage.

A well-drained soil rich in humus is also rich in nitrogen; evidence shows that, in the process of the formation of humus, acids are produced which are capable of dissolving mineral plantfood, and in all probability this is how they become available to the plant; humus increases the water-holding capacity of light soils by consolidating them and making them less porous. It acts as a soil sponge; it ameliorates heavy soils, making them less liable to bake and puddle, so that proper aeration is secured; humus generally increases the warmth of the soil. The dark surface draws more heat than the lighter-colored one; humus furnishes food material for bacterial action in the soil.

Many writers have told us of the many valuable features of alfalfa as an orchard crop. Because of experience and observation with this crop, I must disagree with these men, and believe that too often their recommendation has been based upon theory rather than practice. Generally speaking, alfalfa has not proved to be a good cover crop for the average soil and orchardist. A few of the chief reasons are as follows:

Alfalfa for Cover Crop.

When planted alfalfa is usually put in as a permanent cover crop, and had proved successful on a deep soil with an abundant supply of moisture during the summer months. The success on these soils had led many to sow alfalfa on the lighter soils where the moisture supply is already deficient. Some orchards have been transferred into hay fields, the alfalfa receiving more care and thought than the orchard itself. Too much of the crop is removed from the land.

We must remember that we must have sufficient moisture to feed both the alfalfa and the orchard during the dry summer months. There are very few orchards with soils capable of doing this, since orchards are usually located on the hilly land, or land well drained, rather than on bottom lands. The crop might be well enough if it were turned under or disked into the orchard soil, but to think of harvesting both fruit and alfalfa is out of the question.

A Good Soil Builder.

Clover is an excellent soil builder, and if used as a cover crop, will supply nitrogen and organic matter to the soil. The same difficulties are encountered with clover as with alfalfa and must be guarded against. As a rule, clover should never be left in an orchard for more than two years without being turned under. Special care should be taken on light soils, where the crop should be turned under by all means, and will prove the best possible crop for this purpose. To purchase commercial fertilizer to replace the clover this green manure would mean several times the expense incurred in this simple method. About ten pounds should be seeded per acre.

Clean cultivation in the early part of the season, followed by a cover crop later, is the most up-to-date and best method of handling orchard soils, and can be used with good results more generally than any other system of soil management.

Legumes and Non-Legumes.

There are two main types of cover crops that can be grown, the legumes and the non-legumes. The legumes are all those plants which belong to the same family, as the peas, vetches, beans, clover, etc., and the non-legumes all plants not included in this family. Legumes are more valuable than the non-legumes, because they are capable of gathering nitrogen from the air, and when turned under increase the nitrogen content of the soil.

Rye is one of the best of non-legumes. It grows readily on most soils, catches easily, is hardy, and furnishes a large amount of greenstuff to plow under in the spring, besides furnishing an excellent mulch during the winter months. About ninety pounds per acre should be sown.

Winter wheat is a good second, if rye be unavailable, sown at the same rate. Although buckwheat is a good cover crop on heavy land, it is a very poor winter protection. Rape is very good sown at the rate of six pounds per acre.

Value of Vetch.

Hairy vetch is an excellent leguminous cover crop, and gives good results. It is extremely hardy, will withstand hot summer drought, and is a fast grower. Because of these features and its ability to gather nitrogen from the air, it is, perhaps, the best cover crop grown. It should be seeded at the rate of from twenty to twenty-five pounds per acre.

Crimson clover seeded at the rate of fifteen pounds per acre is also very good. Any crop that will make a good growth in the fall and early spring so as to give a large amount of organic matter to turn under is a good crop to grow.

July and August are the cover crop months, usually turning the ground and making it ready as early as possible, some giving it several cultivations, thus conserving moisture and getting the soil into an excellent state for the seeds to germinate. Where trees are not coming into bearing as soon as they should because of the excessive growth, sowing down the orchard to one of the sod-crops is a good plan, or sowing the cover crop earlier in the season. This will tend to check growth and throw the trees into fruiting.

Cover Crops Make Good Stand.

Many make the objection that the crop will not catch in the late summer. This may be true on soils very devoid of organic matter, but where a proper system of soil management has been maintained in the early part of the summer there will be little trouble in getting any of the crops mentioned to come. If a seeder can be used, the seed is thus sown below the mulch where the soil is moist and the percentage of germination will be increased.

The crop should be turned under as soon as there is a good amount of greenstuff to turn under. Do not wait for the fast-growing crops, such as rye, or they are liable to get ahead and give trouble.

THE SUNDAY SCHOOL

JULY 31.

Saul Teaching at Antioch, Acts 11: 19-30; 12: 25. Golden Text—Acts 11: 26.

Connecting Links—Antioch was, in the days of Paul, a great city. It was third of the cities of the Roman world, the "Queen of the East," and had been, before the Romans came, capital of the Greek kingdom of Syria. In modern times it is known as Antakieh, and is a small town of about six thousand inhabitants. It was built on the banks of the river Orontes, near where the Lebanon and Taurus mountains meet, and about sixteen miles inland from the Mediterranean Sea. It was still, in Paul's time, a Greek city, and its prevailing language was Greek, but there was a mingling in it of eastern and western ideas and customs and of the worst forms of eastern and western vice. There was a large Jewish colony, but Christian preachers had attracted and gathered into the church both Jews and Greeks.

After leaving Jerusalem Paul had gone to his native city of Tarsus, and had continued to preach the gospel in Cilicia and Syria. Barnabas, who knew him in Jerusalem, saw how valuable such a man would be in the mixed church of Antioch. A highly educated Jew of the Pharisees, a thorough Greek scholar, and a Roman citizen, he would appeal to Jew, Greek, and Roman. He had already the purpose and the ambition to carry his message to the outside world. Where could he have found a better starting point?

11: 19-30. They which were scattered abroad. See 8: 1, 4. Persecution had driven many from Jerusalem who carried their faith with them, and preached Christ wherever they went. The very means which were used to destroy the infant church were made in the providence of God to increase and strengthen it. Christianity has always been in greater danger from prosperity and wealth, than from persecution or poverty.

These first missionaries, driven by necessity, went as far as the coast cities of Phoenicia, which lay along the sea to the north of Palestine, and to the island of Cyprus, and to the city of Antioch. It was natural that at first they should bear their message to Jews only. Their Jewish prejudices were still very strong, and they disliked mingling with the Gentiles. Moreover these early teachers had the idea that the gospel, and the kingdom, and the province of future glory and power were for the Jews, and not for other people.

But some of them were men of Cyprus and Cyrene, Jews who had lived so long among Greeks and in foreign countries that their prejudices had broken down. The gospel appealed to them as something broadly human, not to be confined to one sect or nation. They spoke to the Greeks also, and the hand of the Lord was with them. Many were converted, and Jews and Greeks came together in the church and in Christian fellowship. The gospel was already breaking down national barriers. It was beginning to realize the dream and hope of human brotherhood. (See Eph. 2: 11-22).

This startling turn of events came unto the ears of the Church in Jerusalem. It was a difficult and delicate situation to handle, requiring unusual tact, patience, and discretion. Barnabas, himself a man of Cyprus, was chosen to have the direction of this new Christian community, the members of which were now, for the first time, called Christians.

He was glad. He was big enough in heart and soul to appreciate and to understand what was happening. He saw the grace of God, how that God, through the gospel, was building up a new race, which should be neither Jew nor Gentile, but just Christian. He was glad and exhorted them to fidelity and whole-hearted devotion.

A very high character is ascribed to Barnabas. He was a good man, and full of the Holy Ghost and of faith. His mind and heart were open to the generous and broadening and warming influences of the Spirit of Christ.

Since much people were being brought into the church, and the work was growing, Barnabas felt the need of a strong helper, and went after Paul to Tarsus. For one whole year they worked together and taught much people.

The date of Paul's coming to Antioch must have been about 45 or 46 A.D., about ten years after his conversion. We can imagine him at this time, a man of thirty-five or forty years, in the prime of life and vigor, and full of enthusiasm for the great cause which he had espoused. The best testimony of the work done by these two fellow-laborers is that, at the end of that year, they were separated by the Antioch Church and sent forth on their first missionary adventure into the regions beyond. A Christian community which can set itself to its own unfinished task, and at the same time set apart its ablest leaders for missionary work abroad, is truly growing.

Came prophets. The Old Testament prophets were first of all preachers of truth and righteousness. They were interpreters of the past, teachers of the people in law and morals, and sometimes predicters of the future. These New Testament prophets, however, seem to have given themselves chiefly to the forecasting of future events. It is significant that they occupy a very small place in the New Testament Church. The gospel of the Lord Jesus Christ is not much aided in its appeal to humanity by predictions.

Agabus, however, did predict a famine which came to pass in the days of Claudius Caesar. This statement helps us to date the events of Paul's life, for Claudius reigned from 41 to 54 A.D. We know that there was famine in certain parts of the empire during his reign. In Judea, Josephus tells us, there was famine in the year 46 A.D.

This prophecy of Agabus led to a generous resolve on the part of the Christians of Antioch to send relief to their famine-stricken brethren in Jerusalem, and that which they contributed out of their comparative wealth was carried up to Jerusalem by Barnabas and Saul.

12:25. Returning, when they had fulfilled their mission, they brought with them John Mark, Barnabas' sister's son, who was their companion on the first missionary journey, and was afterward the companion and friend of Peter, and writer of the gospel which bears his name.

Application.

Barnabas recognized the marks of the Christian even when they appeared in an unexpected place. As Dr. Jowett writes: "He knew the old fruit, even when he found it growing in a new garden." This is not by any means an easy thing to do. We associate Christianity with certain outward accompaniments, and when these signs are wanting we are not disposed to believe that the genuine article is there. When, after the resurrection of Jesus He appeared to Mary, she did not recognize Him at first. His appearance was different, and she was not prepared for the change. All honor to Barnabas, that when he found Paul doing a most unexpected work he could take up the words of the psalmist: "This is the Lord's doing, and it is marvellous in our eyes."

Pure Milk Products.

The necessity for purity and cleanliness in food cannot be over-emphasized. Any steps taken in any country to further this desirable end are therefore of much importance to Canada. Particularly is this the case when action is taken in the country to the south of us.

There has lately been put on the market an article of food under various trade names, but which is becoming best known as "filled milk". Filled milk is a mixture of skim milk and some vegetables oil, which takes the place of the pure butter fat.

An investigation is now going on before the Agricultural Committee of the House of Representatives at Washington as to the advisability of suppressing or regulating filled milk by law. A number of experts have been summoned to give evidence as to the results of their investigations and research in the matter of protective foods. The first witness called was Dr. E. V. McCollum of Johns Hopkins University, Baltimore, a scientist whose name is well known in Canada.

Dr. McCollum testified that his studies convinced him that dairy products supply the only protective foods likely to be used in sufficient quantities in the diet to promote normal growth in children, optimum well-being in adults, and to prevent the advance of senile decay. The great races of the world are those who are large users of milk and its products. The use of any substitutes in a milk product should be discouraged as having a tendency towards weakened disease resistance, and the encouragement of rickets, among other complaints. In Dr. McCollum's opinion every person could use two quarts of pure milk per day with advantage.

He favored the prohibition of the sale of filled milk.

Good nature and good sense must ever join;
To err is human, to forgive, divine.
—Alexander Pope.

Keep the water troughs filled.

Live stock cannot fight flies and make good returns at the same time. Spray with some good repellant.

Consistent shallow cultivation is the only weapon in the farmer's possession for combatting drought.

Hickory is one of the strongest Canadian woods. When properly seasoned a hickory column will support a weight of twelve tons per square inch cross-section.

Every farmer will be glad to see the increase in the price of hogs, but some, no doubt, will regret the fact that they have none to sell. Steady production is the safest plan in the hog business.

3 Critical Periods for FALL WHEAT

1. At Seeding Time.
   Delay seeding to escape the Hessian Fly. Use fertilizers to catch up wheat growth.
2. In Winter
   Produce good top to protect wheat, and good rooting to overcome spring heaving. Fertilizers produce top and roots.
3. At Heading and Filling Time
   Force early wheat growth by fertilizing at seeding time, and escape drought and heat injury.

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