Soils and Crops

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CULTIVATION OF ROOT CROPS.

The object of cultivation is fourfold: (1) To destroy and prevent the growth of noxious weeds. (2) To develop various degrees of openness of texture and uniformity of soil conditions suitable to plant growth. (3) To modify the movement of soil moisture and soil air. (4) To change soil conditions so as to make it either warmer or colder.

The cultivation of the soil should begin at the first indication of weeds; in fact, it is still better to make a start before the weeds get rooted. To expose them to the hot sun in the germinating stage is the most effective way to kill weeds. If harrowing has been properly carried on cultivation may begin with a cultivator, the teeth of which are 2 to 2½ inches wide, but, if the soil is soddy or lumpy, a narrow-toothed cultivator will be necessary to do effective work. Be sure the cultivator has a sufficient number of teeth to cover the ground effectively—that is, so that the whole surface of the ground will be thoroughly stirred to a depth of from 2 to 3 inches.

The harrow-tooth cultivator is the best to start with; the teeth are narrow, they do not throw the earth over the young plants, and one can cultivate closer to the plants without covering them. Later the larger tooth is better, and as the cultivation season advances and the plants get well rooted, the cultivator should be narrowed and cultivation should be deeper in the centre of the rows. The most efficient work can be accomplished by first going one way all over the field. In a day or two cultivate again but go in the opposite direction to that of the previous cultivation. Cultivation should be continued at intervals just so long as the plants are not injured by horse or cultivator.

The reasons for thorough cultivation are briefly as follows: The soil particles are rounded in form, and when massed together without being crushed they leave a large amount of unoccupied space; this unoccupied space in the soil is needed for the movement of the soil water and air and the spreading out of the root fibres; it is also the home of micro-organisms which develop the available nitrogen used by the higher plants.

If these soil particles are too large and too loosely packed the soil permits the rain-fall to pass through it too freely and the water is soon out of reach of the plants; nor does it return rapidly enough under capillary action to meet the needs of the crop. If the particles are too small and too closely crushed together the water moves very slowly and the air is excluded from the soil; and when the water dries out, the particles are cemented together too strongly by the salts, which have become too concentrated to stay in solution. Consequently, the root fibres are unable to set the soil particles aside; the root system of the crops is prevented from proper development; the plants are cut off from sufficient food supply; and as a result the yields are reduced.

If thorough and continuous cultivation is carried on it will correct the detrimental conditions mentioned, will lessen hand hoeing, and increase the yield and profits, which is one objective to be borne in mind in all farming operations.

AFTER-HARVEST WORK AGAINST WEEDS.

The time to start fighting weeds is in the spring, and among the prerequisites to success is the early sowing of clean plump seed, of suitable varieties, in a seedbed that is well prepared as regards drainage, fertility and tilth. By starting the crop vigorously it is enabled to hold its own to the end with the minimum growth and seeding of weeds. However, in spite of the best of care there will always be weeds demanding some extra attention. In cultivated crops this can be given the season through, and especially before harvest; in grain and hay there is little opportunity until the crop is off. If not delayed then too long, many of the weeds of these crops can still be taken in hand, and some of them with the greatest of timeliness.

Some weeds like ragweed and Russian thistle push up rapidly about this time. Where grain has been seeded weed growth may have to be kept down by the use of the mower, but other stubble should be worked over by means of a disc harrow or cultivator, or plowed very lightly. Besides preventing the seeding of weeds, this also makes conditions favorable for the germination of seeds already in the surface soil, which can be destroyed in the later fall plowing. Some seeds—wild oats for example—do not germinate readily, if at all, the first season, but any farmer who has practiced after-harvest cultivation knows that considerable germination of many weeds can be induced in favorable years.

After-harvest plowing of weedy hay fields is also desirable at the first opportunity that occurs. Such persistent perennials as couch grass, Canada and sow thistles, the hawkweeds, oxeye daisy, etc., are probably at their weakest after using up their reserves in the attempt to mature seed, which timely cutting of the hay should prevent. Plowing at this season is not always the easiest done, but the dryness of the ground, if it does not prevent thorough work, is all to the good in weed destruction. Couch grass, indeed, might well be left alone unless the ground is somewhat dry. The plowing at this time need not be deep; for couch grass particularly it should be only deep enough to get beneath the matted surface rootstocks. After plowing, the object will be to drag the rootstocks into the drying sun by means of a spring tooth or other implement. Thistles and sow thistles will not be so readily dragged out, and can best be dealt with by the use of a duck-foot cultivator to keep all growth cut off as often as it appears. The amount of fallowing thus possible after the removal of a crop should go a long way toward cleaning a field, or at the least preparing for a cleaning hoed crop the following year. A rotation which allows of this procedure every three to five years will hold weeds reasonably well under control.

Many of the worst weeds of crops are also commonly weeds of waysides, pastures and waste places and should be cut by means of mower, scythe or spud, or hand-pulled after a rain, if only to prevent their seeding. Places which can be broken up and cleaned may be later reseeded if so desired, using strong-growing grasses and clovers, which will fully occupy the ground. Besides removing a menace to crops—and often to the good-will among neighbors—a little puttering about in odd corners of the farm works wonders in making the old place more likeable. After midsummer such weeds rapidly become conspicuous, and may well claim some of the hours or half-days when wet weather has upset other plans.

In Honor of Brule.

The first monument erected to the memory of Etienne Brule, the discoverer of Lake Superior and the first explorer who penetrated the lake regions with a view to trade. The memorial was erected during Discovery Week at Sault Ste. Marie.

The Way to Wallop Quack Grass

Begin the Job by Tackling an Old Meadow Sod.

BY J. SIDNEY GATES.

If I can make clear the one simple and well-established principle about quack grass killing, we will be getting well along towards controlling this, the worst of all weed pests on the farm. This principle explains ragged experience with control methods—explains why the plan that worked the downfall of quack in one case proved to be utterly impotent when the job was tackled in another field on the farm.

In addition to the one fundamental principle, there are two general plans in use to kill quack grass. One is known as the smother plan and the other as the tillage plan. In both cases the quack is killed because it is prevented from making above-ground growth. It takes leaf surface and sunlight to keep alive a plant. Keeping down leaf surface, or keeping what is produced so cut off from sunlight that it can't function, kills; by much the same process as drowning an animal.

Now, some animals have to be kept under a long time to drown, whereas with others the process is relatively short. You would have a hard time drowning a frog, though it can be done; but a cat, despite its reputed nine lives, succumbs very quickly. Quack grass is almost as variable in its response to the killing process, no matter whether the tillage or smother plan be used, as are the frog and the cat. If you tackle it when it has the vitality of the frog, there is a hard job ahead. If you first get it into the cat-resistant stage before attempting to give the final blow, the killing is comparatively easy.

Farmers who have killed out quack are usually those who have—usually accidentally—started the smothering or cultivating work on the already weakened grass, whereas those who have failed, though using the same plan, have in the main gone at the job hammer and tongs just where and when the pest got to be the worst.

The strategy to be used in weakening quack grass is very simple, and a few minutes with a spade out on most any quack infested farm will enable you to check up on what I have to say.

The spade will show, in a cultivated field, where the grass has become so well established that there is a full stand even after the early season fight against it, that the ground down to the depth of the furrow slice is completely matted with wirelike rootstocks. This is merely stored up material which quack has put there to draw on next year. It is a rather hopeless task to attempt to kill it directly when so well established as this.

THE SMOTHER METHOD OF ERADICATION.

And then the spade will show, on a piece of old meadow land, that the pest has become more or less root bound. The underground material is much less in extent and is confined to the first three inches from the surface. Beginning with an old meadow sod, there is a much better chance to kill out the quack entirely than where the beginning is made on just recently cultivated fields.

But the spade will show the most surprising thing in a field that has been in meadow and then pastured for a couple of years. It will show that the quack is scarcely fortified at all. The underground parts here are very small in extent and usually are confined to the upper two inches. This is the ideal place to begin the killing-out process.

In repeated tests I have killed out quack by late summer tillage on both old sod and old pasture land. The task does not call for undue labor, and this labor comes at a time when other farm work is not pressing.

The best scheme I have tried is to plow shallow some time in July. It is important that this plowing be shallow. The plow should run just under the mass of rootstocks. Where a gang plow is available it can usually be set to turn a very shallow furrow. There is also a special type of walking plow made for turning a shallow sod. It has a long, gradually sloping moldboard and is usually sold under the name Scotch Bottom.

This shallow plowing leaves the whole quack plant, root and branch, right near the surface. If it is buried deep, it is likely to live over the winter and be on hand to start growth again next spring, and, coming from deep down in the ground, it is hard to kill out. But with the whole plant kept right near the surface, going over every two or three weeks with a disk harrow, or spring-tooth harrow, will usually finish up the killing job before frost. If there is any doubt about all life being extinct, a smother crop the next summer can be counted on to finish up this work.

Quack grass is especially adapted to the smother crop treatment because it sticks close to the deep, rich lands. At least, here is where it becomes the worst pest. Some dense-growing crop suited to local conditions should be used for smothering. Smother crops, however, are of little or no avail unless the quack-infested land is of better than average fertility.

The smother crop method of killing quack to be economical must utilize some crop having a value over and above its quack-killing qualities. Buckwheat has developed a good reputation for its smothering effect. If the land is kept well cultivated up until sometime in late June and then seeded thickly to buckwheat, the quack always gets a jolt, and if the land is rich enough to make a heavy buckwheat growth, the grass is pretty well down and out by fall.

Any farmer who has not yet got this pest on his farm should always be on the lookout for its arrival. The seed may come via baled hay, grain, seed for planting, or it may be brought from a neighbor's farm by a threshing outfit. If identified while confined to a few small patches here and there on a farm, the most heroic and expensive methods can sometimes be advantageously used on these small infested spots. Covering over the whole area with building paper—a heavy grade of tarred paper should be used—lapping the paper and extending it several feet beyond the infested spot and covering the edges with dirt or stones to prevent blowing away, will kill out the grass in a single season. Complete exclusion of light is what does the trick.

Plant poisons are sometimes used on these small patches. This treatment, however, not only is quite expensive, but the poison puts the land out of commission for raising other crops for a considerable period after the quack has been killed. Common salt in quantity sufficient to kill most plants is the one poison which seems to have little or no effect on quack grass.

But for its tenaciousness in cultivated fields, quack grass would be a splendid addition to our domesticated plants. It makes good hay—far richer than timothy. It carries 5.4 pounds of digestible protein, 48 pounds of digestible carbohydrates and only 23 pounds of crude fibre to 100 pounds of hay. Timothy has only 3.3 pounds of protein and only 44.7 pounds of carbohydrates, with crude fibre running up to 28.3 pounds to 100 pounds of hay. But quack does not make a lastingly good hay meadow or pasture. Cut for hay or grazed, as pointed out in the plan for the destruction of the pest, its rootstock reserve rapidly diminishes, and it soon falls down in yield of forage. If old meadows are replowed every two or three years, however, the grass gets re-established and the yield can be kept up. But I have never seen many quack grass stands which the owner would not willingly trade for some other kind of growth. It is a pest to be swatted root and branch.

Profitable Methods of Handling Manure.

Manure is worth money, varying in amount depending upon the method of handling and upon the crops to which it is applied. If the best methods can be followed at no greater expense than the poor methods, the difference in profits represents the return upon intelligence. It is one of the objects of the Experimental Farms to discover the best and most profitable methods of handling manure.

In brief, the cheapest and at the same time the best methods of handling manure is to spread it on the field daily as it is made. This method avoids the losses of fertility which are incurred when the manure is piled, and reduces the amount of labor in handling to a minimum. As the greater part of the manure is made during the winter months, the manure can be spread when the time of both horse and manual labor is not so valuable. This is the method which is used in manuring sod land for corn on the Central Experimental Farm, Ottawa, after considerable experience with other methods. Whenever possible, this method is recommended.

However, there are some circumstances when this method should not be used. If there are many noxious weed seeds in the manure, it is a mistake to scatter them about a field in green manure. The manure should be allowed to rot in order to kill these weeds before spreading it upon the field. The rotting of the manure is a very reliable method of killing all the weed seeds and, as it is very poor business to plant viable weed seeds, this practice, under such circumstances, should always be followed. Again, if the land is very hilly so that the manure is leached away, it is not good practice to spread it during the winter on the snow. In this case it should be properly stored in the yard until the snow is off the land. In Northern Ontario and in Northern Quebec, or in districts which have a very late spring, manure applied on the snow causes the land to remain frozen and wet late in the spring, thus delaying seeding. This is a rather serious objection sometimes, especially when grain or a crop of green feed is to be grown which is to be planted earlier than is necessary for corn.

Where, for any reason, it is necessary to store manure in the yard before drawing it to the field, some simple precautions should be taken to avoid excessive and expensive losses. Moreover, as these losses in a large measure are avoidable, it may be interesting to give the matter some study. Perhaps the greatest loss is incurred from leaching, the water from the eaves of the barn being allowed to drip into the manure pile and the soluble fertility, in consequence, being drained away. This can be avoided by placing the manure in a cheap shed or shelter of any kind. If it is possible, it is wise to allow the stock access to this shed because the trampling of the manure excludes the air and reduces the losses of fertility. Furthermore, if it is convenient, the horse and cow manure may both be placed in this shed, so that the horse manure will not suffer such heating as it would were it piled separately. If the manure must be drawn away from the yard and cannot be spread on the field, a large pile should be made with straight sides and the top sloped somewhat to the centre in order to catch the rain, thus keeping the manure sufficiently moist and avoiding excessive losses of fertility.

So far as their influence upon the growth of crops is concerned, unrotted and rotted manure are of equal value. For twenty-one years, experiments were conducted at Ottawa with the result than an average yield of 21.7 bushels of wheat were secured on land to which unrotted manure was applied and 21.6 bushels on land to which rotted manure was applied; with mangels, 20.5 tons were secured from unrotted manure and 20.2 tons from rotted manure. These yields are strikingly uniform and show beyond question that neither class of manure will produce larger crops from equal amounts of application. However, as the rotting process causes a considerable loss in weight, it is evident that a much larger supply of manure will be available from the unrotted source.

Another important point which has been learned from experimental work, is that smaller applications of manure, either made more frequently or covering larger acreages, have proved more profitable than heavy applications. While it is impossible, owing to the difference in the fertility of various soils, to prescribe exactly what might be called smaller applications, it may be said, in a general way that, at Ottawa, an application of 15 tons per acre has given as good returns in a four-year rotation as an application of 18 tons per acre, in a three-year rotation. In other words, an application of 3¾ tons per acre per year has given as good results as an application of 6 tons per acre per year. This difference is quite marked and is very important.

Public service is one of the country's greatest needs.

Home Education

"The Child's First School Is the Family"—Froebel."

The Golden Years—By Edith Lochridge Reid

A young mother stood on the porch and watched her little son trudge off to school for the first time alone. Her face was pensive and the yearning of the mother heart was almost translated into tears as she turned to a neighbor and said, "I feel almost as if I'd lost him, five years seem a short time to have him to myself."

The neighbor, older in wisdom and experience, smiled encouragingly, and replied, "A short time, perhaps, but a golden time, full of loving training, rich in home influence, every day of which was a preparation for this little journey on which he has just started."

"Well, I hope I've succeeded in giving him the right things to take with him," observed the young mother seriously, "but it's a big responsibility to take a child through those golden years, isn't it?"

"The biggest responsibility, my dear," agreed the neighborly advisor; and then added, "but I'll whisper a secret,—the rewards of this duty well-done are the sweetest and most satisfying in the world."

Yes, the Golden Years are the sweetest and fullest of opportunity, so let's enjoy them, and live happy, normal, everyday lives WITH our children. We can never tell them how to act, that is a flitting method of training, but we can show them how we meet difficulties and problems and disappointments with fortitude and a smile, and then, most important of all, allow them to meet their own trials alone in their own way. Not to protect from the world, but to prepare for life in the world is our duty as mothers during the Golden Years.

Some mothers out of their tender love, err in giving too much supervision in early childhood. If we see an aggressive playmate taking more than his share of toys in the yard, our first impulse is to help our child to maintain his rights, but unless the encounter threatens to grow beyond his strength, it is much wiser to let tiny son fight his own battles. He must do it some time, and the older he is the harder it will be to start.

Self-reliance is an absolutely necessary asset to success in life, and the child that goes out equipped to make his own decisions and look after his own personal interests without too much assistance, will have fewer griefs and hard knocks.

In those first five years, our child gets his ideals for life's conduct. He may never have heard the Ten Commandments or the Golden Rule, but he has seen them acted, if he is in the right kind of a home. He isn't on the fence in regard to right and wrong. He has learned by seeing mother handle situations, that a thing is either right or wrong, but that there is no neutral ground.

So while we all may have ideals of conduct for our children in after years, the possibilities for attainment during early childhood are manifest and measured by their response to temptations in the home environment.

POULTRY

When new cockerels are needed for a range flock it often pays to select them in the late summer and let them grow up together. This prevents a lot of fighting that may result if full grown cockerels from different sources are placed together during the winter. The early buyer also has a good selection of the best early maturing males at a price much below their winter value.

The best breeding cockerels are birds that show signs of good size for the breed, early maturity and a bright intelligent head with medium beak. If you have pedigrees back of the birds, that is desirable, but do not take birds on their pedigree alone. I have seen two cockerels from the same mating showing great variation. One is the slow feathering type and about half the size of the other at four months of age. One shows weak vigor, the other a picture of strength and vitality. There is no question of which type you wish to multiply.

DAIRY

Chapped or cracked teats in the cows are more common than usual this summer, probably due to the dry season, although this condition may be brought about by many causes, such as walking in wet grass or through mud holes and streams; also from wading in manure or lying in wet bedding; it may be caused from the nursing of the calf or from milking with wet hands; or again, from cold air.

The extent of the trouble will vary, depending upon the sensitiveness of the skin, the manner of treatment that the condition has had, the length of time the animal has been affected, etc. At first the teat is very dry and red, tender to the touch as shown by the restlessness of the cow during milking. If this is allowed to exist for any length of time, without treatment, deep cracks will form in the teat. Treatment should be given early, and then it should cause very little or no inconvenience. Teats that are sore and tender should be treated after each milking with an ointment made of vaseline, ten parts, and oxide of zinc, one part. If the condition becomes pretty serious before treatment has been started, it may be well then to use an antiseptic solution and bathe the teat in this; for this, bichloride of mercury can be used, one part to one thousand parts of water; a two per cent. solution of cresol or creolin may be used, but the mercury is as good as any. Fill a cup with the solution and place it against the udder, with the teat suspended in the liquid for several minutes; this should be used after each milking. Then paint the teat with the following: One part of tincture of iodine in four parts of glycerine; paint this on with a camel-hair brush.