check-row planter is the best machine to use. For drill planting the ordinary grain drill with only the necessary spouts open gives good satisfaction. There are advantages in planting corn in drills as well as in the check-row system. Planting in hills according to experiments gives a higher yield of both corn and total crop than sowing in drills, putting in the same amount of seed in each case. Planting in hills also permits of cultivating each way with the horses making it easier to clean land through a more thorough cultivation, which is a big item in corn growing. Planting in drills is very easily accomplished. Cultivating with the horse can be done one way, and many believe that, the finer stalk which results makes a better silage and a better feed than the coarser stalk from hill planting.

In planting we would advise putting in plenty of seed. Of course, there is no use of over-planting, especially where the corn has been tested and the farmer knows with reasonable certainty the percentage of germination to expect; but better crops generally result where one kernel too many is put in a hill than one too few. After the corn is planted it is a good practice to immediately give it a stroke with the light drag harrow, and keep this up every few days until the corn is so large that it will be injured thereby, at which time the one or two-horse cultivator should be started. This harrowing of the crop after planting is important, and is one of the best means of conserving moisture and killing weeds while they are yet very young which can be put into practice.

What Experiments Have Taught About Fertilizers.

With all the science connected with agriculture authorities are not yet able either by chemical or mechanical analysis of soils to determine whether that particular soil requires commercial fertilizer or not. And if crops indicate that plant food is lacking scientists or real practical farmers are unable to tell at once what element of plant food is required by the plants in order to bring them to a reasonable stage of productiveness. There is one way of finding out the requirements of the soil and that is by experimenting with the crops themselves. With a system of plot experiments elaborate enough to try out the three important elements of plant food, namely, nitrogen, phosphoric acid and potash, any farmer can decide what the soil requires for particular crops better than the most advanced scientists in the land.

Two experiments have been tried by the Central Experimental Farms management, one at Fredericton, N.B. and one at Kentville, N.S., although these were only of one-year duration they bring to light some information relative to the fertilization of farm crops and furthermore show that it is a difficult proposition to arrive at the proper quantities of the proper elements. At Fredericton, four fertilized plots gave no profit, yet on the same area on apparently similar soils several plots upon which the application of fertilizer was made gave splendid returns. In these two tests in the Maritime Provinces the profits from the use of fertilizer ranged from 1 per cent. to 101.9 per cent. reckoned on the total value of the crop. This latter gain means a crop worth twice as much as the average from the unfertilized plots, yet this immense gain found after deducting the cost of the fertilizer does not necessarily mark the limit of possibilities.

In a large number of instances there is a profit to be reaped from the use of fertilizers. The problem is to find out those special elements and their amounts which will yield a maximum profit. It is apparent that the larger profits do not necessarily follow the application of the largest amounts of fertilizers. In these experiments it is noticeable that the largest increase in net profits was effected by one of the smallest applications in the list, a total of 435 pounds of fertilizer was applied costing $6.85. The net profits from this amounted to $62.77 or 101.9 per cent. In this particular case the application consisted of 75 pounds of nitrate of soda, 50 pounds sulphate of ammonia, 50 pounds superphosphate, 200 pounds basic slag and 60 pounds of sulphate of potash. The yield per acre from this plot was 320 bushels, out of which 300 bushels were marketable. The plot which corresponded most closely to this in yield was one which received an application per acre of 75 pounds nitrate of soda, 70 pounds sulphate of ammonia, 250 pounds bone meal, 250 pounds super-phosphate and 150 lbs. sulphate of potash. The yield per acre from this plot amounted to 322 bushels out of which 304 were marketable. However, owing to the large application of fertilizer it returned a profit of $57.38 per acre.

One outstanding feature of the experiment is that it is advisable to use a fertilizer containing the three principle elements of plant food. Where one or two of the elements only were furnished a moderate profit of only about one-half of that otherwise contained is shown. The stand was not so good and the percentage of culls was much higher than where a complete fertilizer was used. As regards healthiness field notes showed the plants on the complete fertilized plots were the freer from rust and had, in their appearance, greater vigor. This is a finding of these two particular experiments only and there might be soils so rich in potash that an additional application of that element of plant food would show no results. Clay soil in good tilth has the reputation of containing a liberal amount of potash yet we know of some townships the soil of which is considered sandy to be very rich in potash. These localities are noted for their production of potatoes.

After all experiments have been tried on experimental and model farms it still remains the duty of every farmer to find out on his own fields by crop experiments and tests the requirements of his soil. No one can tell him what he should apply. It is his duty and his only way of knowing what fertilizer and how much to use.

Killing the Most Troublesome Grass.

Every season a number of questions come to this office asking how a field may be cleaned of couch, quack, scutch, or twitch grass. This is one of the most troublesome perennials with which the farmer has to deal, and once established in a field it requires persistent effort year after year to keep it down and heroic measures if it is to be finally eradicated. The writer remembers well a certain fourteen-acre field which at one time contained a number of stone piles around which twitch gained a foothold owing to the poor cultivation given to the land surrounding the piles, because it was not practicable to get the implements up close to them all the way around. The stone piles were removed and the field thoroughly worked, but wherever a pile had been twitch remained in considerable quantities for several years. Every few years in the rotation the field was summer-fallowed or hoed, and this would weaken the twitch patches down very materially, but by the time the hoed crop was again placed on the field the patches of the pest would be about as strong and vigorous as ever. It was kept from spreading and weakened down, so that it did very little damage, only by persistent cultivation in the years of summer-fallow or hoeing. Had the field not been thoroughly cultivated at this time no doubt the patches would have spread until the entire acreage would have been over-run.

Owing to the large number of creeping jointed rootstalks which penetrate deeply into the soil, and which possess greater vitality than the roots of any other common grass or weed, the plant is hard to cultivate out of the soil. The disk harrow should not be used, as it cuts the rootstocks into small pieces, each one of which will sprout at the joint and grow into a new, vigorous plant. As soon as the crop is removed from the field in the fall it is a good practice to plough lightly. The experiences of those who have been fighting twitch grass for years is that it does not pay to plough deeply. Plough four or five inches deep, and thoroughly cultivate the top with a spring-tooth cultivator. By "thoroughly" is meant going over the ground time after time until the greater portion of the roots are pulled out on top. These may be raked up with the horse rake and burned, or if the season be dry the drag harrows may be used frequently to pull them up, rattle the dirt off, and leave them exposed to the drying of the sun. The roots are very hardy and will often sprout out and grow after remaining on the surface, apparently withered and dead, for several days. It is safer to rake up and burn.

Badly-infested fields should not be sown to a grain crop in the spring. It is better to leave them until some time in May, plough them again shallowly, and work the field as a complete summer-fallow or as a summer-fallow with buckwheat or rape. We might have said that it was good practice late in the fall to ridge up the land. This leaves the roots exposed to frost, which will kill many of them. After spring ploughing, use the spring-tooth cultivator as often as necessary, and if the field is not too badly infested a hoed crop may be put on it, but this must be thoroughly worked. It is generally better to work the land at least once a week up until about the first of July, when it may be sown to buckwheat, putting on a thick seeding of from ¾ to 1 bushel per acre. A heavy coat of manure enriches the land, and insures a more rapid and ranker growth of the buckwheat, which, if thick enough, smothers out or keeps back the twitch.

Many now prefer the sowing of rape in preference to buckwheat. This is generally sown late in June. It is well, where this crop is put in, to have the land well prepared and manured, and to sow the rape in drills according to the common practice of sowing turnips. Put in about 1½ lbs. of seed per acre, and cultivate the rape until such time as it is too large to permit of further cultivation. This insures the growth of a very rank, thick top, which, like the buckwheat, smothers out the twitch. Cultivation is the main thing, and some good farmers still believe that the bare summer-fallow is the best way to fight the pest.

Frequent cultivation throughout the summer, provided the weather is comparatively dry, is a very effective means of killing twitch, although it is rather expensive, as a season is lost on the field. The plant also will exhaust a great deal of its substance if allowed to produce a hay crop, which should be cut before it blooms so as to prevent seed forming. Twitch spreads by seeds as well as by running rootstocks. If handled in this manner it may be ploughed as soon as the hay is removed and worked as outlined during the following fall, and next season sow the buckwheat, rape, or handle as a bare fallow. Twitch will, if left alone in a pasture field, exhaust itself, but this takes years and should never be resorted to. The writer remembers a two-acre field which was entirely over-run by the grass, and which was left in sod as a calf pasture for nearly twenty years. When ploughed up some few years ago not a sign of twitch grass remained. It had grown so rank and spread so rapidly that it must have exhausted itself, for blue grass had taken its place entirely and the field is now absolutely free from it. No farmer should feel discouraged because he has a little twitch to fight. Persistent and careful cultivation will keep it down.

Corn Experiments.

Editor "The Farmer's Advocate":

The Ontario Department of Agriculture, through the District Representatives, is arranging to conduct a variety corn test in practically every county in Ontario. Seven standard varieties of corn have been selected, and first-class seed in each instance secured. Eight reliable farmers in each county have been selected, with a view to covering the county as evenly as possible, with instructions to devote one acre of land to the seven varieties. Definite instructions will be given to each experimenter as to methods of planting and cultivation. During the summer months each of these fields will be carefully inspected and comparisons made between the varieties as to stand of plants, size of leaf, size and number of ears, date of maturity, yield etc. It is intended that this experiment shall be conducted for at least three successive years, so that climatic conditions may be less likely to interfere with the results secured in the Province. In Ontario, where corn for silage is becoming so largely grown, it is felt that an experiment of this kind, demonstrating the advantages of certain varieties for certain districts, will do much to increase the yield, and improve the quality of silage, and form a basis to get the farmers in the corn-growing counties of the Province to undertake the task of growing standard varieties that are suited and that will meet the requirements of the market.

C. F. BAILEY,
Assistant Deputy Minister of Agriculture.

Is Alfalfa Injured by too Many Cuttings?

Alfalfa is not always a dependable crop, and every year we hear farmers complain of losing their catch of new seeding, or of the older seedings winter-killing. It seems that particular conditions as to soil, and climate are necessary that this crop be a success one year after another. However, in connection with the killing of old alfalfa sod, or at least of the crop after the first year's cuttings have been made, it seems that the number of cuttings made during the season has some influence on the condition of the crop the following spring. We have often wondered whether or not the three or sometimes four cuttings made during a single season were not detrimental to the future of the crop. It seems to stand to reason that so many cuttings must, to a certain extent, weaken the plant. In conversation with an Oxford county farmer a few days ago this point was brought up, and it was his belief that there was no doubt but that too many cuttings weakened the chances of the crop successfully withstanding the rigors of winter. He cited a case of one particular field on a neighbor's farm which was the only field of alfalfa in the neighborhood which stood the winter a few years ago, and this field was only cut once the previous season. Late in the fall it was pastured lightly, but a great deal of the crop went down on the field, held the snow, protected the roots, and the alfalfa made an excellent stand the next year, while neighboring fields cut two or three times the previous summer killed out almost completely. One of the main points brought out in favor of alfalfa growing is the number of cuttings which can be made in a single season, but if this experience is anything to go by it seems that on certain soils, where it is questionable whether or not alfalfa will do its best, better success might be obtained from fewer cuttings, say two in a season.

Another point brought out by our Oxford county subscriber was that alfalfa can be used to