

those of the different genera, such as common or rough-leaved turnip, Swedish turnip, rape, and even of some of their individual varieties, possess sufficient distinctive characteristics to enable a careful observer to find out whether or not they are mixed. The art of colouring has in the case of clover seed attained to great perfection, yet careful and repeated observation of the position and shading of the natural colours in the genuine seeds will serve to show the difference between them and the best examples of artificial colouring; which last is not nearly so applicable to grass and turnip seeds, but the sulphur smoking of the former, and the oil-dressing of the latter, serve to impart a freshness of appearance which the seeds do not actually possess.

Killing is generally done by oven-heating (sub-roasting), or want of vitality may arise from extreme age in the seeds; in either case the seeds will appear dry when bruised, which is peculiarly marked in turnip, rape, and other oleaginous seeds, from the comparative dryness or absence of oil which they exhibit when crushed. Most people are familiar with the difference between fresh and roasted peas, and a similar difference in appearance is presented, under the microscope, between fresh and roasted small seeds.

For further illustrating some of the preceding results we are enabled, through the kindness of Mr. James Bryson, optician, Edinburgh, to give the four accompanying engravings from magnified photographs, prepared by him, the first three of which are from a sample of what, in market phrase, was termed "good red clover seed," and the fourth from another of good yellow clover, medick, or trefoil seed.

No. 1 shows really good plump seeds of red clover in different positions, when magnified by only a good pocket microscope. It is usually of a shaded purplish and yellowish colour, some of the seeds being entirely yellow; and at the Great Exhibition of 1862 there was a Norwegian sample similar in colour to No. 4; although the form of the seeds showed that they belonged to the true red clover—*Trifolium pratense*—some of our native wild varieties of which have also yellow seeds.

No. 2 represents imperfectly ripened seeds of red clover, enclosed in their still adhering husks. These as shown in the engraving, resemble small acorns with their cups attached; and in sample, they are so unlike the seeds of any of our field weeds that many have taken them for those of the dodder, the pest of Dutch clover fields. In the sample from whence they were taken these were present in about the proportion of six per cent.

No. 3 exhibits different views of the rib-grass, common ribwort, or plantain seed—*Plantago lanceolata*—magnified on the same scale as the others. This was present in the sample to about thirteen per cent.; and, being of comparatively little value, it is too generally introduced among clover seeds for the purpose of adding a "paying per-centage" to the dealer's profits. It is, however, well known by its deep brown colour, somewhat shining appearance, and different shape to that of the clover seed, and being easily distinguished by the naked eye, those who purchase it from sample have themselves to blame.

No. 4. Yellow clover seed—*Medicago lupulina*—is of a uniform sulphury yellow colour, and more regular kidney-bean-like shape than the red clover seed, from which it also differs in possessing a distinct peculiarity of smell. None of this seed appeared in the sample from whence the preceding three were selected, although it is more employed than any other for adulterating red clover seed, both in its natural state, and when "improved" by colouring.

While fraudulent dealers have everything to lose, the fair dealer has nothing to fear, but much to gain from microscopic or other investigation; for how often do we see careless cultivators blame the seedmen for sending them a mixture of weed seeds, when the fault of weed growth was entirely their own.

Agriculture.—Its Advantages.

To the Editor of THE CANADA FARMER:

SIR, I propose to set down briefly some of the leading advantages and disadvantages of Agriculture, as a pursuit, and for the present shall consider the first of these topics. Agriculture is the art or science of cultivating the earth. Its object is to develop from the soil as large a quantity of vegetable products, and indirectly of animal products, as possible. *It conduces to health.* With what different feelings do the merchant and farmer leave their pillows in the morning; the one, cheerful with good health and buoyant spirits, goes forth to his labours at the dawn of day, greeted by the music of the feathered songsters, breathing the pure, fresh air, sweetly scented by the odour of the flowers, the other, perhaps after a sleepless night, walks in a thoughtful mood to his counting house, probably anticipating the insolvency of his customers, or the ill success of a voyage. How many an invalid that has seen the ploughboy on his way to his work in the morning, whistling as he goes, has wished for a pastoral life. The evidence of statistics show that the agricultural population live to a greater age than any other. *Agriculture secures ordinary wealth.* No other occupation or profession can furnish from its own means the supplies for all our necessary wants. Food, raiment, and many luxuries, are among the fruits of the farmer's cares and labour. Although the farmer may not become so wealthy as some of our merchant princes, yet take the whole class of merchants with all the farmers, and the average wealth of the latter class, if it does not absolutely surpass, will compare favourably with the former. Not only does it secure individual, but also national wealth.

It promotes morality.—It tends to preserve the morals and raise the heart to Him who giveth seedtime and harvest. This was man's original occupation, and even now, the missionary tries, after proclaiming the gospel to the heathen, to induce them to cultivate the soil, as the best method of keeping them good Christians, and civilizing the remainder of the tribe.

It tends to independence.—With what honest pride the farmer can look over his golden fields, his richly laden orchards and growing flocks, with the happy assurance that his substance is increasing from year to year, and that he himself is far above want. The manufacturer or merchant often fails, although he may give his whole time and attention to his business, for the fault does not always lie in himself, but probably in some foreign market, or in the insolvency of some of his hitherto good customers. But what has the intelligent and industrious farmer to fear? His funds are invested in solid ground; he depends on no earthly guarantee, but on the All-wise Being, the giver of every good and perfect gift. Society is divided into the producers and non-producers. To the former class the farmer belongs, while the latter class have to depend upon the producers; hence we often hear the merchants and mechanics wishing for a good crop, and have nearly as much anxiety about the harvest as the farmer himself, they must depend to no small extent on the farmer for what they eat and wear.

The pursuit of Agriculture gives scope for intellectual pursuits. There is no business that demands such extensive knowledge. The farmer has to deal with the works of nature, learn the different characteristics of the earth, the air, and the seasons. He must know something of vegetable and animal physiology, entomology, etc. Besides, he must understand mercantile business. If in the future the farmers of Canada wish to be successful, they must pay more attention to agricultural education.

It is pleasant.—There is no other occupation or profession so useful, so honourable, so healthy, so happy, and so independent. Surely such an occupation must be gratifying. The pleasures of rural nature are consistent with every period of our lives. Why, then, it may be asked, has agriculture been so distasteful to farmers' sons? The hard manual labour which many of the farmers have had to endure, and the little education which they possessed, may have hindered some from engaging in this pleasant occupation. But times are changing. Animal labour is being substituted for manual, and more recently,

the natural and mechanical powers for animal labour. The use also of agricultural chemistry is coming more into vogue. These are sure indications of the progress of agriculture. The intellectual labour of the farmer is increasing, while the manual is decreasing. Science and art are rapidly multiplying his appliances and elevating his calling. "Agriculture," says a recent writer, "is an art,—Man is the artist; the soil his laboratory, manure his raw material, animal strength and machinery his power; air, heat and moisture his agents; and grains, roots, fruits and forage his products."

CULTIVATEUR.

York Township.

How to Enlarge our Crops

To the Editor of THE CANADA FARMER:

SIR,—The following extract from a speech of Mr. Mechi, at Birmingham, deserves our thoughtful attention:—

"Keeping the crops free of weeds is, I know practically, one of the best and cheapest methods of enlarging our crops. The last saving a farmer should resort to is that of hand or horse-hoeing. The neglect in this matter is painfully obvious, and robs the country of millions annually. Don't tell me of sowing thick to smother the weeds. The cultivation is worth the money irrespective of weeds. I always horse-hoe my wheat, beans and peas, once or twice with Garrett's horse-hoe (at about one shilling sterling per acre), and hand-hoe twice or even three times, at a cost of about seven shillings and six pence or ten shillings per acre. Women afterwards hand-pick any weeds that have escaped the hoes. We know by the leaves of our flowers when there is anything wrong below, so it is with our field crops, and as I came here by rail, certain bilious-looking crops indicated an uncomfortable state of their roots, owing to the want of drainage or food in the subsoil, or in consequence of weedy competition."

The above teaches an important practical lesson worthy of being learned and remembered by every farmer in Canada. We cannot of course employ hand-labour here as they can in the old country, but we may do more to secure clean cultivation than we generally do. The implement named by Mr. Mechi—"Garret's horse-hoe"—is perhaps known to you. Are you aware which of our cultivators or horse-hoes most nearly resemble it?

I have thought an implement is wanted specially to cultivate and keep clean the borders of our fields close up to the fences, as there the weeds are apt to accumulate. Perhaps some of our artisans connected with the manufacture of agricultural implements may devise some addition to the ordinary plough to fit it for such a purpose.

A FRIEND TO IMPROVEMENT.

Township of York, 31st Aug., 1868.

Refuse from Flax Mills.

To the Editor of THE CANADA FARMER.

SIR,—In your last number a subscriber asks:—"What is the best manner of utilizing the waste from flax mills for agricultural purposes; whether it should be rotted, and if so, what is the readiest and quickest mode of effecting this object?"

I take it for granted that by flax mills your correspondent means mills for scutching flax, and by the waste, what is commonly known as the *shives* of flax. If the mill is worked by steam, the best manner of utilizing this waste is to use it as fuel in generating steam; but if the mill is worked by water, then the waste should be used as manure. Now, it is a well known fact that the most substantial manures, if they are not well rotted, produce a less active effect on the growth of plants than the simplest fertilizers which have been reduced to a state of extreme division.

Then as to the readiest and quickest, and the least expensive mode of effecting this object, he should make a compost of the waste with horse-dung &c., turning it before it matures too much, and if necessary, watering it with liquid manure.

A. K.

Toronto, 7th Sept. 1868.