

Good Seed.

It must be evident to every thinking man that there is no one thing which the farmer can do, with perfect confidence that it will insure the production of a good crop. There are many operations which are essential to success, and while no one of them alone can meet all the requirements of the case, no one of them can safely be left out. It is absolutely necessary that the land should be well prepared; but if nothing else were done, the best preparation in the world would not produce a crop. It is also necessary that good seed should be used; but even this alone will amount to nothing. There must be a good soil, a suitable preparation, and proper culture of the growing plants, in connection with the use of good seed, if the best results are to be secured.

For some reason, which is not plain to be seen, the

SELECTION OF THE SEED,

as one of the leading elements in the production of large and profitable crops, has never received the attention which it has deserved. Other matters seem to have engrossed the attention of most of the men who have made agriculture a special study. They have been engaged in trying to discover new varieties, to learn the best methods of fitting the soil, and in developing new systems of cultivation. Meanwhile the practical farmers have gone right along in the old way of using seed from their own crops, and without making a careful effort to select that which was the best fitted for their purpose. There have been some individual exceptions to this rule, but the general practice has indicated a great lack of interest in this very important part of their work. The study and thought which have been given, and the experiments which have been made in these and other directions, have led to valuable results. The labors of men who have been engaged therein should be gratefully recognized, and farmers should cheerfully avail themselves of the benefits which have thus been placed within their reach.

But in addition to all the light which has been obtained, and all the advantages which have been secured in these directions, there is need of a clearer realization of the fact that the seed exerts a controlling influence upon the quantity and quality of the crop. It is for want of attention to this fact that so many efforts to obtain large yields have failed of success. In some of these cases all of the conditions except this one seem to have been complied with; but the seed which was used was not the best, and the best results were not obtained. Just as long as effect follows cause, just so long will it be impossible to secure first-class crops from second-class seed. We know that in the animal world the character of the offspring is determined by that of its parents. We have the same assurance concerning the individuals of the vegetable kingdom. The seed as surely determines the character and appearance of the crop which it produces, as parents impress their characteristics upon their children.

Let us consider some of the powers and qualities which are, or should be, possessed by the seed of our ordinary farm crops. In some inexplicable manner there is hidden in every well developed seed a mysterious quality called

VITALITY.

This quality enables the seed, when placed under certain favorable conditions, to germinate, and thus commence the series of changes which will result in the production of other specimens of its kind. As long as the seed is kept intact, this power lies dormant. When it becomes active, a change in the character and appearance of the seed is manifest. The interest of the farmer requires that this change shall take place only in those specimens which he uses for the production of future crops, and that they shall remain in their natural condition until, or very nearly until, the time when they are cast into the soil; for the process of growth injures the seed for other purposes, and if it takes place long before the seed is planted, spoils it for reproduction. Consequently, it is for the interest of the farmer to keep his ripened grain as much as possible from all untoward influences. If his wheat, which is in the stack, is for several suc-

cessive days exposed to warm and wet weather, much of it will sprout. In other words, the vital principle becomes active, chemical changes are effected, and growth is the result. In such circumstances growth inevitably means injury, and this injury is very closely in proportion to the extent to which the changes are effected. If the rain is of short duration, and the kernel merely absorbs a little moisture which is soon evaporated, no great harm is done. But if the rain continues and the kernel keeps on absorbing moisture, in a short time the starch which it contained, and which is absolutely necessary to the production of nice flour, is converted into sugar, which is considerably diluted with water. As the process continues, the sugar which has been formed is changed to cellulose, and the kernel is wholly ruined for flouring purposes. The conversion of the starch into sugar before the kernel is planted also injures it for seed, because the plant cannot live for any length of time away from the soil, and, unless the seed is at once put into the ground, all the growth which has been made will be wholly lost. The young shoot will very soon wither and die.

This is not all the injury that has been done, as we shall see at once when we reflect that the starch which was stored in the kernel was just the kind of food which the plant requires for its nourishment until its roots become strong enough to obtain from the soil, and its leaves are developed enough to secure the materials for growth which are furnished to all plants by the atmosphere. But the process of sprouting through which the kernel has passed has changed the materials of the seed and partially used them as food for the plant which had become partly developed. When such a seed is planted it will absorb moisture, but there will be no starch and but little sugar upon which the plantlet can feed. Some seeds will only sprout once, and if the process of germination is checked it cannot be renewed. Other seeds will endure some interruption, though they are greatly injured thereby. From this it will be evident that the selection of seed is a matter of importance to the farmer, and that in making the selection he should be careful to obtain only that in which the quality described as vitality is unimpaired.

Another quality which some seeds possess, and which should always be sought when a selection is made, may be described as

VIGOR.

This can never be present without vitality, but there can be vitality without vigor. There are men in the world who are alive but who possess but very little vital force. It requires about all their strength to maintain their feeble hold upon life. The same principle applies in all its fullness to the case of plants. In a great many fields of grain, plants can be found which, while living, are but little better than dead. They will grow for a while, and the fields may look a little better for their presence, but the difference which they will make in the yield of the crops will be very small. From these extremely weak specimens there are various grades of improvement until we reach the plants which are full of life and strength. Each and every stalk of these several grades has power to produce seed after its own kind. If the seed from the strongest plants is saved to furnish the germs for a future crop, the plants which will be secured will, if circumstances are favorable for their development, be almost sure to be strong and vigorous. But if seed is saved from the weak stalks, the product of that seed will be very likely to be still weaker than the parent stalks. The grade of plants can be lowered much more easily than it can be raised. The natural tendencies seem to be downward, rather than toward a higher type. Still, this tendency can be counteracted, and the various kinds of plants can be greatly improved by careful selection, combined with good cultivation.

The facts that the seed has a strong power of

IMPRESSING

its own characteristics upon its product, and that this power is somewhat modified by a natural proneness to seek a lower level, should induce farmers to make a very careful selection of the seed which they design to use for planting. They also show very plainly why some farmers

who have good land and give good culture do not obtain paying crops. These men are not careful in making a selection of seed, but take about an average lot for this purpose. In this there is the product of some stalks of each of the several grades of vigor. While part of the seed was produced by the best stalks, much of it came from the weakest plants. The grains from the best stalks will probably yield a good crop, but those which came from the lower grades will be very sure to have all the undesirable qualities of their parent plants. If we sow seeds from weak plants we must expect to have weak plants for our product, and if our crops are largely composed of weak plants, they will be both small and unprofitable.

Another quality which seed should possess is

PERMANENCE OF CHARACTERISTICS.

This is an important quality and one which a great deal of seed does not possess. It can be secured by careful selection of the seed which is used in a series of years. Without it there is a great deal of risk that the crops will be poor. In their efforts for the improvement of seeds, horticulturists often have a great deal of trouble to fix the characteristics of certain specimens which they wish to preserve, and it often requires many years to enable them to secure the desired result. But when permanence has once been established it can be retained by carefully selecting the seed which is to be sown. If this selection is neglected, the variety will show a strong tendency to run back to its original condition. The common carrot furnishes an illustration of this. As long as the seed is carefully saved from good specimens, and proper cultivation is given, the crops which are obtained will be like the ones which produced the seed. But if there is carelessness in producing the seed, or culture is neglected, it will be but a short time before the useful carrot is changed into a worse than useless weed. Many crops retain their distinguishing characteristics much better than the carrot, but with all plants there seems to be a strong tendency to revert to some former style of growth and appearance. It requires a vast amount of patient effort to firmly "fix" the characteristics of new kinds of grain. In selecting seed the farmer should keep this fact in mind, and not only secure seed which is good in itself, but also that which will, under good cultivation, produce its like. And when this characteristic has been secured it can, and should, be maintained by means of careful selections of seed for future crops.

EARLY MATURITY

is another quality which the seed of farm crops should possess. In the minds of many farmers this quality is generally associated with a dwarfish habit of growth and a light yield of grain. But these things do not always connect themselves with an early ripening of the seed. Still it is quite natural that the longer the time which a crop requires in which to mature, the larger it should grow, and we find that many of the very large varieties of grain are late in ripening their seed. Perhaps if plants were left wholly to themselves this would be a universal rule, but under the present methods of culture there are many exceptions. With some varieties man has long been experimenting, in order to change the time of ripening, and his efforts have been very successful. Some medium-sized varieties of corn have been made to ripen some weeks earlier than their original time, and this has been accomplished without diminishing the size of either stalks or ears, and without decreasing the yield per acre.

PURITY.

This is another quality which the seed of farm crops ought always to possess. By this term we mean not merely the quality of producing its kind, which has already been considered, but perfect uniformity of appearance. In this respect an immense amount of seed which farmers use is deficient. Instead of taking pains to have their barley or wheat all of one variety, or if different kinds are cultivated to plant them in fields distant from each other, too many growers allow several different kinds to mix and make no effort to secure purity of the seed. In a few cases this may be due to the impression, which some farmers have, that grain will "do better