

there will be a constant gain in growth, while the services will be sufficient for the purposes of farming. The horse, if kept on hay alone, must have his masticating powers in almost perpetual motion; the ox reserves some of his time for rumination, hence there may be a difference in the cost of keeping. The cost of equipping a horse for the regular farm service is greater than that of an ox, and more time is required to put on and off these equipments. In shoeing, the difference of cost is in favour of an ox, as also it is in the quality of the manure they make. The ox has an intrinsic value arising from the good qualities of his flesh and skin, the one being good for food, the other for leather, whereas very little can be made out of a dead horse. For some kinds of farm service, the horse is preferable to the ox, such as light ploughing and harrowing, but for carting, hauling stones and other heavy work, he is not so good. He is better adapted to the road service, and is useful for milking, marketing, and meteleneing, he also may be used for journeying and visiting. It is convenient, and perhaps profitable, to keep both these useful animals as well as cows, sheep, and other stock, but when the number of horses greatly exceed those of oxen, or even cows, it is time to begin to count the cost, which may be done by opening account current with each animal, keeping debt and credit, or what you give or receive from each.—*Maine Farmer.*

Culture of Wheat.

Wheat is the most important of all the grains and its varieties are numerous. Among those now in cultivation, the following may be enumerated:—The bearded, the Dunghas, the golden ear, the velvet ear, the egg-shell, the hedge-wheat, the Essex dun, the Kentish yellow, the white and red Essex, the Mungoswell's, the Burwell red, the Hunters, and the Georgian. A general division of wheat is made into white and red, with several shades between, and summer and winter. Winter wheat may be brought into the nature of summer, by altering the time of sowing. If winter wheat be sown at the period for putting summer wheat into the ground, in the course of two seasons the winter will become of a similar habit as the summer, and the same process will bring a summer wheat to be a winter one.

In general, the fine white wheats are preferred to the brown and red; but the latter is most profitable for wet adhesive soils, and unfavourable climates, on account of its hardness and ripening early. A red wheat, of great productiveness, has been recently introduced into Scotland from *Mar-lane*.

The variety of wheat most profitable to be produced must depend upon the nature of the soil, as land which has produced an indifferent crop of one may yield an abundant crop of another kind, and land is frequently found to yield better crops if the varieties be alternately changed. It has been observed, that a mixture of grain produces the heaviest crops, and that mixed flour makes the best bread.

The richer description of clays and strong loams are the best adapted for the production of wheat, but if properly cultivated and well manured, any variety of these two soils will produce excellent crops of this grain. Good wheat land ought always to possess a large quantity of clay and little sand; for although light soils may be made to produce good crops, yet the strong clay lands in general yield the heaviest grain. Sandy soils, being deficient in firmness, do not afford sufficient support to the roots of plants, such as wheat, which do not sink far into the soil. There are light soils, however, made from decomposed granite, felspar, or clay-stone, compounded with vegetable matter, which produce excellent wheat. These soils abound in the neighbourhood of Edinburgh, and in Fifeshire, and the wheat from them is frequently superior to any in the Edinburgh market. The produce of these soils, however, is much hurt by dry weather.

Colonel le Couteur, of Jersey, has made the culture of the best varieties of wheat his particular

study for several years, and has arrived at the following conclusion by actual and careful experiment:—namely, 'that one ear of a superior variety, sown grain by grain, and sutured to tiller apart, produced 4 lb. 4 ounces of wheat, whereas another ear of an inferior sort, treated in the same manner, produced only 1 lb. 10 ounces. This proves that it is of paramount importance to select the most productive and farinaceous sorts for seed; it being obvious, that a farmer who would have sown his whole crop with the last variety, would have probably been ruined; whereas, the superior variety would have enabled him to farm with profit.' It is hardly possible to enter a field of wheat nearly ripe, without observing that the ears of some of the plants are much superior to the generality of those growing around. Several new and excellent sorts have been obtained, by intelligent farmers making a selection of these remarkably superior ears; saving and growing them apart until the pure stock was increased to serve themselves, and, in time, their immediate neighbourhood. By such means, the *Hardcastle*, the *Hedge-wheat*, *Hunter's*, *Heckling's*, &c., have been originated; and with manifest advantage to the sowers, so long as the sorts were kept pure, and attention being paid to giving the sorts those most suitable soils which experience had pointed out. This mode of obtaining improved varieties of corn, so strenuously advocated by Colonel le Couteur, has been practised but by few farmers; a general idea prevailing among them that it is the richness of the land and judicious culture which gives quality, and consequently value, to the sample. In this they are partly right; because, though very fine wheat, in a miller's estimation, may be grown on poor land, it is impossible to grow a profitable crop; a great bulk of both straw and grain answering the farmer's purpose better than the high quality of the latter.—But Colonel le Couteur seems fully convinced that both these objects, that is, quantity and quality, may be obtained at the same time, upon ordinary wheat land; and this is a result that should always be kept in view by agriculturists. Adapting the sort to the soil is one means for securing success. The red and yellow wheats answer better on the heaviest clayey loams than the white varieties, which are delicate, and more suitable for lands of a lighter description." Sir George Mackenzie of Coult has found by experiment that the variety of wheat, cultivated so successfully by Colonel le Couteur, thrives well in *Floss-shire*, and in that northern county actually yields a heavier produce than in *Jersey*. This, however, we must ascribe to Sir George's skilful mode of farming, more than to either soil or climate.

The late Mr. Brown of Markle, an experienced agriculturist, was of opinion that profitable crops of wheat might be produced every second year on rich clays and loams, if well cultivated and situated in a good climate. Land, however, must be highly manured and judiciously fallowed, to bear such frequent repetitions of wheat.

"The season for sowing wheat is necessarily regulated by the state of the land, as well as of the season, on which account it is not always in the farmer's power to choose the moment he would prefer. After fallow, as the season allows, it may be sown from the end of August to the middle of November. On wet clays, it is proper to sow as early as possible, as such soils, when thoroughly drenched with moisture in autumn, are seldom in a proper state for harrowing till the succeeding spring. In the opinions of many experienced husbandmen, the best season for sowing wheat, whether on fallow, rag-fallow, or ploughed clover stubble, is from the beginning of September to the 20th of October, but this must depend upon the state of the soil and weather.—In East Lothian, on dry gravelly loams, in good condition, after a clover crop, and well prepared, wheat has been known to succeed best when sown in November. After drilled beans, when over the season will admit of ploughing and harrowing, wheat may be sown from the middle or end of September to the middle of November; after this season, the sowing of wheat ought not to be hazarded till the spring quarter returns.

After turnips, when the crop is consumed or led off, and the ground can be properly ploughed, wheat may be sown any time betwixt the 1st of February and the middle of March, and it is customary to plough and sow the land in successive portions as fast as the turnips are consumed. It

is only on turnip soil of a good quality, verging towards loam, and in high condition, that winter wheat, sown in spring, can be cultivated with success. When circumstances are favourable, however, it will generally happen that such land, when wheat is not too often repeated, will nearly produce as many bushels of wheat as of barley.—The wheat crop, therefore, on an average of seasons, will exceed the value of the barley crop considerably; hence its culture is an object which ought not to be neglected."

Wheat, as will afterwards be more particularly mentioned, is liable to certain diseases, as, for example, smut, mildew or rust, &c. With the view of preserving the grain from these most injurious disorders, it is customary to prepare the seed by steeping or pickling it in a kind of saline brine, or diluted urine. The value of this process may be learned from the following experiments, as stated in various reports before us. Mr. Bailey of Cheltenham tried experiments on seed in which were a few balls of smut. One-third of the seed was steeped in urine, and limed; one-third steeped in urine, dried, and not limed; and the other third sown without steeping or liming. The result was, that the seed which had been picked and limed, and that which was picked and not limed, was almost free of smut; while that which was sown without undergoing this process was much diseased. The following experiments were made at Lord Chesterfield's farm of *Bradly-Hall*, in *Derbyshire*:—The first was on a peck of very smutty wheat, one-half of which was sown in the state it was bought, and the other washed in three waters, steeped two hours in brine strong enough to float an egg, and then limed. The result was, that two-thirds of the wheat grown from the unwashed seed was smutty, while that produced by the steeped and limed seed had not a single ear of smut. The second experiment was made upon some very fine wheat, perfectly free from smut. A quart of this was washed in three waters, to make it perfectly clean; it was then put for two days into a bag in which was some black dust of smutty grain, and the result was that a large portion of wheat thus sown was smutty, while out of twenty acres sown with the same grain, not inoculated, not one smutty ear was found. Mr. Taylor, junior, of *Ditchingham*, near *Bungary*, ubbed a number of ears of wheat with the powder of smut, having moistened them to make the powder adhere; one-half of these were washed, wetted with chamber lye, and limed. A similar quantity of dry wheat was then procured, the whole being dibbled, each parcel by itself. The produce of the infected wheat was three-fourths smut; the same infected wheat, steeped and limed, was perfectly sound. The valuable results arising from steeping wheat seed need not be further illustrated, and we shall now proceed to describe the process.

Steeping or pickling is performed, as already mentioned, after the seed has been washed, by allowing it to lie for a time amongst stale urine, diluted with water, or salt brine, of sufficient strength to float an egg. This seed is put into tubs, containing as much liquid as will cover the grain a few inches, and allowed to be well stirred, so as to bring all the light grains to the surface, which are skimmed off as long as they continue to rise. Another way is to put the seed into baskets, which are immersed in the water, are easily taken out, and can be conveniently placed over an empty tub to drain. The seed is left for three or four hours in the chamber lye, or full six hours in the pickle, after which the liquor is drawn off, and the wheat spread thinly on the floor of the granary, where it is well sprinkled over with quick-lime, slacked in the liquid. About half a peck of lime is sufficient for a bushel of wheat, and it should be well stirred, so that every grain may get a portion. If the seed is to be drilled, it should be passed through a coarse sieve after being limed, which will facilitate its progress through the machine. The grain will thus be quickly dried; and it should not lie more than six hours in the heap, then be spread out and used the following day.

Some caution should be used in having the lime properly slaked, for if this is not done, too great a heat may be raised, which will destroy the vegetative principle. Doubts have been expressed of the efficacy of lime, and a solution of copperas is used on the Continent instead. Dry powdered lime would certainly have no effect, but when