

rous, but, wanting lateral support and shelter, would, most likely, fall to the ground and be mildewed. On the other hand, if sown too quickly, the plants rob each other; the straw is slender and weak; and the grain is, of course, thin and light. Plants of a medium strength yield the finest straw and heaviest grain; and were it possible to distribute the seed at about one inch and a half distances upon good ground, and each producing four tillers, the crops would appear like a solid mass of straw and ears at harvest. A thick, rather than a thin standing crop, is always the most profitable. If very rich land be thickly seeded, the numbers pressing on each other prevent any portion of the crop becoming over luxuriant, the plants reciprocally equalizing each other; and, if very poor land is sown, it also should be well-seeded; because the poverty of the soil prevents all thickening from tillers; consequently, the best possible crop is reaped from sowing thickly upon poor land.

Drilling is a means by which two and a half bushels of wheat or barley can be deposited very equally over an acre of land, although not equally over the surface. The plants in the drills stand rather too closely together, and the spaces between are without plants; and though there can be no doubt, that if the supernumeraries in the drills stood in the spaces between, the whole would be a more regular and abundant crop, yet, it must be admitted, that drilling is the most eligible method of sowing, and far more precise than it could be done, or as it often is, at random.

But where no drill is employed, broadcasting must be practised, and if the surface is properly prepared, experienced seedsmen will strew the seed with the utmost regularity. The ground must be prepared, by being previously harrowed down; and whether lea or fallow, all marks of the plough must be obliterated. The furrows of leas are frequently extremely tough, and not easily harrowed to raise a sufficiency of loose mould to receive the seed, unless the lea has been ploughed with a thin coulter, and well rolled before the short-tined harrows are put on to raise the requisite depth of mould. But however tough the furrows may be, the labours of the harrows must be continued until the surface is thoroughly comminuted.

This previous preparation of the surface is of much importance; it secures an equal plant (supposing the seed to have been carefully sown) over the whole surface, and about one bout of the harrow will *heel* it sufficiently—that is, about one inch below the surface, the true depth at which all corn should be covered.

It is hardly necessary to state, that the wheat plant is supported by two sets of roots, which are distinguished by the appellations of *seminal* and *coronal*. The former are produced immediately from the seed, at whatever moderate depth it

may chance to be buried in the soil. The infant stem rises from the centre of these first roots, its lower joint being lengthened to within half an inch of the surface, where the second joint begins to be formed, and from which the two first leaves are developed above ground. The place of these first leaves is called the crown of the plant; hence the strong, fibrous roots which afterwards proceed from the crown are called *coronals*. These are produced in the spring, and are the roots which principally assist to carry on the plant to maturity. Soon as the coronal roots come in action, the seminal, together with the slender pipe attached to them, wither and die away, they no longer being useful to the plant. This, then, is the manner of the development of a wheat plant, the seed of which was buried too deeply in the ground; and though nature attains her end, by lengthening the first joint up to the proper station, it is an unnecessary expense of power, which might have been saved, had the seed been laid in its proper place at first.

It is for this reason, and to prevent any seed being too deeply buried, that the labour of harrowing down after the plough is so necessary a process. A uniform surface is necessary for the drill, as well as broadcast; and in the latter case the seed is uniformly and equally buried by the harrows—that is, not more than one inch under the surface. At this depth both sets of roots are near together, and the plants rise and progress more vigorously. In sowing barley, it is an old custom to sow one cast before, and another after the harrow, but it would certainly be better to sow both casts after the surface has been harrowed down.

For small seeds, such as turnips, clover, and grass, the seeds can hardly be too thinly covered; of course the surface should be made perfectly level by the harrows, to receive the seeds, and, when sown, the bush-harrow and roller cover it sufficiently; unless, indeed, the surface be in the state of dry dust, in which case short-tined harrows might be requisite, to let in the seeds a little deeper.

I have stated above, that the wheat plant is perfected by two sets of roots; this is the truth, but it is not all the truth; for the wheat plant, like all others, has jointed stems, and may have, instead of two, several distinct sets of roots; for not only do fibrous roots proceed from the first and second joints, as already stated, but from the third and fourth also; in fact, every tiller ejects its own radicles, whether they arise from the second or third joints of the stem, and more especially, if by rolling in the spring, the plants are in some measure earthed up.

The purport of the above observations is, to impress upon the agriculturist the absolute necessity of always harrowing the surface of the soil before the sower, except only in the case of dibbling, when harrowing may be dispensed