

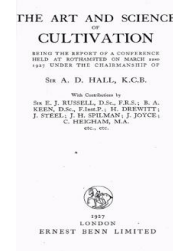
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The Art and Science of Cultivation

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Cultivating the Chalk and Brick-earth Soils of West Sussex

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have greatly improved in simplicity and reliability, and, even in their present early stage of development, their value for autumn cultivations in both dry and wet weather and for spring work has been conclusively shown. Nevertheless, we still have much to learn in this new development. It is not simply a case of substituting one form of haulage for another; there is a host of concomitant problems in adapting implements and cultural methods to the new conditions. Such straightforward questions as the relative merits of deep cultivation and subsoiling still await solution. Some experiments appear to show no advantage, while others show a considerable benefit. Such divergent results are to be expected until our knowledge of the physical effects produced in the soil is extended.

The fundamental point to be borne in mind in all work of this nature is that the form of power and the implements are only a means to an end—the production of a suitable seed-bed for the given crop, and the maintenance of appropriate soil conditions for the plant over the whole of the growth period.

Our best hope of systematic advance is to pursue steadily our investigations into the soil properties on which tilth depends and, as opportunities offer, to test our conclusions by selecting outstanding problems for practical field trials under a variety of different conditions. It is essential for the progress of our work that it should be critically reviewed from time to time by the practical farmers, the implement- and tractor-makers, so that the field trials may be designed to give the maximum practical information to all concerned.

CULTIVATING THE CHALK & BRICK-EARTH SOILS OF WEST SUSSEX

By H. DREWITT

Colworth Manor, Chichester

To a farmer the subject of this conference is his daily concern, although perhaps he seldom tries to analyse the reasons for what he does.

Modern cultivation of the soil may be said to have begun when the common fields were enclosed and distributed among individual cultivators, each of whom was then, for the first time, able to carry out his own ideas on the subject without reference to what his neighbours were doing. Up to about forty years ago the preparation of the soil was carried out with the same implements, improved

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in detail perhaps, as had been used for centuries; then came the spring-tined cultivator, the disc harrow, and finally a machine of moderate power to draw them—I mean, of course, the tractor.

To understand what the farmer aims at it is necessary to understand why he directs his aim in the particular direction it takes, or, in other words, why he grows the crops he does. The chalk soils of the South Downs and the brick-earth of the plain between them and the sea require very different management and cropping. The soil overlying the chalk varies from patches of heavy clay, where beans can be grown, to the thin white soil 3 or 4 in. thick, where rabbits and stones are the only profitable products; but in many of the little valleys and combs there are pockets of reddish earth with a ragged flint, which are as highly esteemed for their cropping powers as the brick-earth. All these varieties of the chalk are easily worked with two horses, and although they dry quickly, crops upon them will withstand a considerable drought, as the chalk just below keeps the roots of the plant cool. These conditions largely govern the crops grown and therefore the cultivations made for them.

Wheat is not much grown; where it is, great care must be taken to consolidate properly the soil at seed-time and again after the winter frosts are over. Where a breeding flock of sheep is kept, they must have the first consideration; therefore no chance must be neglected to ensure the root crop being got in at the proper time. The stubbles will be ploughed the first time as soon as the winter catch crops are sown, ploughed again in early spring, worked to a tilth, and then after ploughing and working a third time there should be little difficulty in getting a plant of swedes or rape to stand, if care is taken to conserve the moisture while the seedling is making its first roots. Of course a good down to feed the ewes on is of the greatest assistance to the arable land, and although the sheep for generations have been carrying away the fertility of the down to the arable, it seems to make little difference to the grass. It is difficult to see what future these chalk farms have; a very large amount of capital is required to lay them to grass, fence and provide a water supply. Considerable tracts of the downs have already become covered with worthless bushes, thorns and brambles.

On the brick-earth of West Sussex practically any crop except beans and hops can be grown successfully; there is a sufficient depth of staple to conserve enough moisture to withstand almost any drought. Nearly all of it can be worked with two horses, so long as care is taken to avoid treading it when it is wet weather; in fact we have a saying that we often get on faster by keeping the horses in the stable than by letting them muddle the ground about when it is wet.

Formerly the four-course or Norfolk rotation was strictly followed, now the aim seems to be to grow as few roots as possible; hence it follows that a much smaller head of stock can be carried, less capital is wanted, and a lower scale of production is aimed at. If an outlet can be found for it, sugar-beet looks like becoming a popular crop; 1000 acres were grown last year, and 4000 are promised for this season.

For wheat the land requires to be ploughed with two horses, pressed, and harrowed about six times. Much of the seed is broadcasted on a stale furrow; it is rolled and sometimes harrowed in the spring, the object being to get the ground thoroughly consolidated round the root; for this reason bare fallows are not much liked, as the land is left too light.

White winter oats frequently follow the wheat or, more rarely, take its place. After this crop is off the long preparation for the root crop comes. If time allows, the land is ploughed with two horses or a tractor directly after harvest, then ploughed again in the winter with two or three horses; the stale furrow is broken down in the spring with cultivators and rollers, and, after the final ploughing, is well worked to a fine tilth to get the seed well started—this is the place in the rotation where the tractor with a disc harrow is of the greatest assistance, enabling long hours to be worked to take advantage of the most favourable opportunities. After the root crops are fed off or removed the land is once ploughed, rolled and disked, or rolled and harrowed and drilled with oats; or, where fed off, late sugar-beet may be put in.

When hard roads became general a former generation spent a large amount of labour in chalking the brick-earths, very greatly to their benefit; as they lay within easy distance of the chalk formation this work was thought to pay quite as well from the lessening of the work to make a tilth as from the increase of crop. It was made possible by the large number of horses kept to cope with the pressure of spring work, for in those days four or five ploughings for roots, with innumerable rollings and harrowings, were the rule. I have here the tillage book made when my father entered my present farm in 1870; there were 4 ploughings, 25 drags, 10 small harrows, and 8 rolls to get a tilth for swedes, and this was in a dry season.

Another way to assist in promoting a tilth is to sow deep-rooted crops; a clover ley ploughed after it has been down for two years will generally work well, and my limited experience of sugar-beet seems to indicate that the land usually works well after it.

While we owe a deep debt of gratitude to the agricultural implement-makers for providing us with our present equipment, in my case it is only a lively sense of favours to come. What I want to see is a machine which can be drawn by a tractor that will rapidly

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and thoroughly move the top 3 in. of soil directly after harvest to start all the weed seeds growing. I want also a combined machine of light draft which will cultivate, roll and harrow in one operation; it would be a miniature edition of the combined implement moved by cable engines as used in Lincolnshire and Sussex. Finally, I want a tractor which will not take half the power it develops to move itself along and which will not consolidate the land—something like the dragons which move and have their being at Aldershot, I mean.

ON THE LAND IN SOUTH-EAST ESSEX

By J. STEEL

Burnawne, Rochford

BEFORE going into the cultivations for the various crops I should like to draw your attention to the climate and the class of land I had to work. The south-east of Essex is without doubt the driest district in England, the rainfall hardly ever reaching 20 in. The district was subject to long periods of drought in the spring and summer, so spring cultivations had to be hurriedly carried out if successful crops were to be produced. With the dry east winds moisture evaporated quickly, making a good tilth difficult to get unless you had a good command of power just when wanted.

The farms were situated on the north bank of the Roach, a tidal river, with a gentle rise and facing south; land adjoining the river was light, lying on sand and gravel, always dry, and could be worked at any time of the year and producing early crops. The fields on the rise were a better class, lying on various subsoils, and on top of the rise it was gravelly and much given to burning in parts. A narrow band of clay ran across the farm, and to get early cultivation I had to do considerable draining, which was very successful, and let me get on with work that without the drains would have delayed getting in crops quite a fortnight owing to wet spots on every field. Had I known, I might have used the mole-plough, which I ultimately did in some fields with great success and at much less cost.

As a guide to system of working. The farms extended to 700 acres, about 400 arable, carrying a stock of 50 milk cows with followers, 150 breeding ewes, and latterly 50 sows. All the land before my tenure was farmed on the stitch; fields that were heavy I laid down to grass and kept arable only what could be worked on the flat. Cultivations were carried out with horses and tractors, and steam tackle was always available on hire when wanted. Having been an