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The Growth of Cheaper Winter Food for Livestock

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THE GROWTH OF WINTER FOOD FOR CATTLE

By T. C. WARD

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IN presenting this paper I want it to be understood that I can lay no claim to scientific knowledge, and can only try to describe processes that are in fairly general practical operation in a particular county—namely, Shropshire. All the methods I describe will not be applicable to the different climatic conditions that may prevail in other parts of the country, or be suitable to soils of a different character from those with which I am familiar. They achieve, however, their aim in our district, so far as the point of the marketing of our products, and there I confess we are generally beaten by conditions over which we have no control.

Great changes have taken place in our live-stock feeding, and these alterations have entailed consequent modifications in the production of the bulky feeds required for consumption on the farm.

Ten years ago, for instance, I could not have taken anyone to a single feeding farm in the county that had a complete water supply laid on to its feeding cattle. We relied upon the moisture the cattle obtained from the roots to keep them going. This entailed the liberal use, and consequently growth, of great quantities of roots, if a reasonable number of fat cattle were to be marketed from the holding.

Now most of the more up-to-date feeding farms are equipped with an adequate water supply to every animal. As a consequence, more hay and other dry feeds are consumed, also fewer roots; resulting in a substantial reduction in the amount of labour required during the winter months for carting and handling those roots.

An even greater change is now only in process of evolution, due to the establishment three years ago of a sugar-beet factory in the centre of our county. We are, in fact, only now accustoming ourselves to these changes, but the use of pulp from the factory has already become so general that no paper upon "The Growth of Winter Food for Cattle" would be complete without including more than a passing reference to the cultivation of the sugar-beet crop.

Owing to the passing of town horse-traction there is practically no market for hay sold off the farm these days. Having adequate water supplies laid on directly to the cattle, much more hay can be, and is, economically consumed in our farm-buildings in the production of beef.

Therefore, ample supplies of well-harvested hay are a necessity of our present winter-feeding methods.

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In the production of any of our root-crops I should place in the forefront the need for clean fallow land to work upon.

To obtain this, vigorous and effective autumn cultivation, carried out at the right time, is essential. Spring cultivation will rarely rid a field of squitch, unless the weather conditions be exceptional.

My own invariable practice is, as soon as each cornfield that is not sown with new seeds is cleared, to send a tractor with a well-weighted, rigid-tined cultivator into the field to thoroughly break it up. This, in my opinion, is the tractor's best and most effective job on the farm. After harvest my tractors are at work practically all the hours of daylight—at other times they are rarely on the land.

Autumn cultivation properly carried out will not only clean a field but keep it clean.

Having clean fallow land to operate upon, we proceed to apply such reserves of farmyard manure as we may have on hand in our fold yards from the previous winter's feeding season, ploughing it in to a depth of 5 or 6 in. only. During the last few years we have found it desirable to apply this well-rotted farmyard manure to the land intended for beet, for all authorities appear to agree that newly made strawy farmyard manure, particularly if it is not applied early, is likely to produce fangy beet, of unsatisfactory weight and with a low sugar-content.

The land that has had the autumn application of farmyard manure is ploughed a second time, at our convenience, during the winter, to such a depth as the character of the land will stand without disturbing undesirable subsoil—9 in. is about the limit that any of my own land can be safely ploughed; much of it will not stand this depth; but 10 in. is ploughed with advantage in some parts of the county. It will be noted that by the above methods the farmyard manure is left, by the two ploughings, sandwich fashion, some 3 in. or so below the surface.

To the remaining fallow land new season's farmyard is applied—with us this becomes available from the beginning of December onwards. When applied with only one ploughing we do not in any event exceed an 8 in. ploughing, believing that for any roots except beet, carrots or parsnips there is a definite limit to the depth from which the other root-crops draw their food. Also, there always seems a tendency for farmyard manure, or humus of any kind, to go downwards into the land, not come up, and the same tendency applies to an even greater degree in the case of lime.

If the cultivation of the beet crop has taught us anything it is that the majority of our soils have for many years been deficient in lime. Whatever else the beet-plant can be stunted of, it must not be kept short of lime, or failure is certain to follow. Therefore, between the completion of our deep ploughing and the final preparation of the seed-bed prior to sowing, we, as opportunity offers,

and with suitable weather conditions prevailing, make our applications of lime, generally of ground lime or ground limestone. I have myself mainly switched on to the latter, for ground quicklime is, as everyone knows, most villainous stuff to handle, and can be applied only on calm days.

Having by the before-mentioned methods obtained clean fallow land, farmyard-manured, well ploughed and limed, it is, given a normal season, a fairly easy and expeditious process to put in the root-crop. I grow a fair acreage of potatoes, but as potatoes are not ordinarily recognized as a cattle food, except in seasons such as this and the past one, I propose passing on to the planting of the mangold crop.

For the necessary breaking up of the furrows for the planting of the root-crop I make as little use as possible of the tractor. Frankly, I do not like the tractor in the spring on loose land at all, believing that unless the land be exceptionally dry underneath one can easily get a solidification or compression below the surface that is decidedly injurious to plant life. I have had convincing proof of this only this last season. Therefore unless we are hard pushed, or the land is in exceptional condition, we rely upon our horses for this work.

The mangold crop we sow on a 22-in. drill, though, owing to the uncertain germination of the plant in recent years, I contemplate trying part of my acreage on the flat. Before seeding for the mangold crop we usually apply $1\frac{1}{4}$ cwt. of sulphate of ammonia, 3 or 4 cwt. of kainit (or $1\frac{1}{2}$ cwt. of muriate of potash), 4 cwt. of 30 per cent. superphosphate and 2 cwt. of 60 per cent. bone meal, following this with a top-dressing of 1 cwt. of nitrate of soda with a little kainit (to help distribution) after singling. If the mangold plant be exceptionally regular, or the field in less than average condition, we apply a second top-dressing of a similar kind just before finally leaving the crop for nature to do the rest of the work.

The beet crop has much the same spring treatment as our mangolds, beyond that we do not exceed 20-in. drills and also put the greater portion of the crop in on the flat, as it undoubtedly has a quicker germination than mangolds, and consequently gets out of the way of annual weeds better.

My artificial-manure application for beet is the same as for mangolds, beyond that we apply only 1 cwt. nitrate of soda as a top-dressing in any event, having become satisfied through the experience of previous seasons that any greater application of nitrogenous manure is calculated to force excessive top and lower the sugar-content of the root itself.

Mangolds—seasonal conditions permitting—we like to get in during the second and third weeks in April, though it is often later.

Beet we aim at getting in during the third or fourth week in April. When first we set out to grow beet we were informed that

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full and satisfactory crops might be anticipated if sown well on into June. Our experience entirely contradicts this, and each season so far the beet sown in April or very early in May has been a heavier crop, with a higher sugar-content, than later sowings.

Swedes I never sow before the 20th of May, on account of mildew. Even this date has been too early this dry season. Finger-and-toe we are not troubled with. About twenty-five years ago I took over a farm upon which a sound swede or turnip crop could not be grown because of the disease. By the simple method of adjusting the rotation so that the crop did not fall to be grown on the same land oftener than once in eight years we got rid of the trouble entirely. Now that I have altered all my arable land to a six-year course, instead of four, the swede and turnip crops do not fall to be grown on the same land oftener than once in twelve years, and finger-and-toe is never seen.

For swedes and turnips we, of course, apply a lighter dressing of artificial manures than for any of the other root-crops, my experience being that there is a definite limit to the amount of purchased plant-food that the swede crop will profitably utilize. We therefore apply only $\frac{3}{4}$ cwt. of sulphate of ammonia, 2 cwt. of kainit (or $\frac{3}{4}$ cwt. muriate of potash), with 4 cwt. of 30 per cent. superphosphate and 1 cwt. of steamed bone meal to prevent caking in the bags, top-dressing with 1 cwt. nitrate of soda after singling.

The mangold crop we single with a 7-in. hoe, beet with a 6-in. and swedes with an 8-in., all singling, as with every other possible job, being done by piece-work. Horse-hoeing of course is continuously carried on, weather and harvest operations permitting, from the time the various roots are big enough to stand it until the little white roots begin to appear across the drills, when it seems time to desist.

Our final operation to the beet crop is to draw enough soil up to the plants to cover the crown. This seems to be well worth doing, as, in my opinion, it undoubtedly reduces the proportion of beet to be cut away in topping to satisfy the requirements of the factory.

The harvesting of our root-crops of course commences with the potatoes, followed about the 1st of October with the beet-lifting, which, owing to the steadily increasing acreage which we are annually planting, goes on all through October and November—all pulling being done by piece-work, a good proportion of it by women from industrial districts.

The harvesting of the mangold crop commences with us about 15th October, and takes until about 7th November, the pulling, covering of what is necessary, filling into carts, and soiling up, all being done by male-labour piece-work. I may remark in passing that we never at any time leave any mangolds uncovered even for a night, believing that if a crop is worth growing at all it is worth

taking care of when grown, and should not be left at risk of frost doing damage unnecessarily.

Swedes we cut and drop on the ground when required for immediate use for the cattle, but slung into heaps and soiled-up if intended for sheep food or later seasonal use for the cattle. We aim at having all root-crops secure from weather risks not later than the end of November or the first week in December.

As indicated previously, our normal rotation is a six-year course—two root-crops and one of clover alternated with three straw crops. The price of home-grown grain being what it is, and to enable us to grow the acreage of beet we desire, we started two years ago to follow our potato crop with beet instead of spring corn. This now throws us with about half our arable acreage under roots of one kind or another, entailing a very heavy labour bill, but at the present level of prices I propose keeping my acreage under grain within the narrowest possible limits.

Growing cattle foods, vegetables or beet *may* pay some years; producing grain under present conditions cannot.

THE GROWTH OF CROPS FOR DAIRY CATTLE

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Crops for Dairy Cows

ABOUT two-thirds of the cost of keeping a dairy cow arises from feeding, and on the majority of farms this portion is divided almost equally between home-grown and purchased foods. In theory concentrated foods are needed chiefly for cows giving 3 to 6 gallons. These do not, as a rule, make up a big proportion of our herds at any time. Most farmers have perforce to content themselves with sales equivalent to an *average* daily output of under 2 gallons. If one wishes to visualize a dairy herd, therefore, as an economic unit, it is a picture of a number of animals giving rather under 2 gallons apiece, and needing somewhere about 11 or 12 lb. starch equivalent per head per day, that one must call up.

It is possible to make up from home-grown foods alone a ration closely approaching this standard. One of the main points in herd management is, therefore, can rations so constituted be grown more cheaply than their equivalent could be bought?

The whole question of costs on a dairy farm is surrounded by difficulties. To instance but two, crops are grown by labour