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GRASS — THE SOURCE OF HUMUS!

"It is an old saying that any fool can farm, and this was almost the truth when farming consisted chiefly in reducing the fertility of new, rich land secured at practically no cost from a generous government. But to restore depleted soils to high productive power is no fool's job, for it requires mental as well as muscular energy . . . " (*The Farm That Won't Wear Out,* by Cyril G. Hopkins, 1913)

Restoring *"depleted soils to high productive power"* revolves around the return of organic residues. By microbial decomposition, these residues become that small percentage of the total soil-mass we call humus. In the last issue of *Your Living Environment,* we elaborated on the vital role of humus and the insidious threat its stealthy disappearance poses to mankind — via the ecological pyramid.

Now let's look at PASTURE — man's No. 1 source of humus! You probably take grass very much for granted, but pastures of *high* quality are a *rarity.* "Quality" takes the form of GRASS/LEGUME mixtures. The best pastures do not occur naturally. *They must be created* — and maintained — BY SKILFUL MANAGEMENT!!!

What is grass? Where does it come from? What is its purpose?

The grass/legume mixture is man's MOST IMPORTANT "CROP". And while *livestock* are its link with *man* — *livestock* are also the link from this "crop" back to *humus* in the soil!

If humus is the end-product of death — GRASS must be the beginning product of life!! Grass is the raw material of life! It is the carrier of nutrients for animal and human survival! And it is the great combiner of the organic and inorganic in our living environment!

God's Word On "Grass"

Now a reminder of where grass comes from:

"And God said, Let the earth bring forth grass, the herb yielding seed . . . " (Gen.1:11).

" . . . if you shall hearken diligently unto my commandments . . . I will give you grass in thy fields for thy cattle, that you mayest eat and be full" (Deut. 11:13-15).

"He watereth the hills . . . He causeth the grass to grow for the cattle and herb for the service of man: that he may bring forth food out of the earth" (Psa. 104:13,14).

Grass — And Its Purpose

The purpose of grass is to provide vegetable and animal protein for man. It is a vital part of God's entire earthly Creation — of which God said:

"Let them have dominion over . . . all the earth . . . I have given you every herb bearing seed, which is upon the face of all the earth, and . . . to you it shall be for meat. And to every beast of the earth . . . every green herb for meat" (Gen. 1:26-30).

Yes, God was as much the Creator of *"grass"* as He was the Creator of everything else. Along with trees, grass is the means by which He "clothes" the earth. Dense pasture moderates the extremes of cold and heat and can virtually eliminate soil erosion. By slowing-down the run-off from rain it also increases water-absorption by soil.

The beautiful simplicity of the system is that its good effects trigger other benefits. Increased grass production per acre means more grazing for animals, and also more raw material for humus formation. Increased organic residues mean rapid multiplication of earthworms and soil micro-

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organisms. That speeds up nutrient recycling via decomposition and effects the further release of *new* minerals from inorganic soil.

Better Quality And More Quantity!

A number of end-results spring from these chain-reactions — for example, such favourable conditions for plant production ultimately modify ALL SPECIES, (plant, animal and man) in that particular environment!! As mineral and protein content rise, plants become leafier and less stemmy. This means that there is more tonnage per acre and each mouthful goes further!

Another modification to plant species is that their *"normal"* growing-season can be extended — at *both* ends too! Most pastures are low in production. And one reason is that they are slow off the mark in early spring. They tend to be stemmy and run quickly to seed at the first sign of dry, warm weather. In other words, production starts *LATE* and finishes *EARLY.*

Fertile soil is a well-known precursor of agricultural abundance, but perhaps you can now see more of the marvellous inter-play of other forces involved. It is a superbly designed system. Obedience to *ONE* simple law, (the return of organic residues) triggers off a beneficial chain-reaction through soil, plants and animals — culminating in man himself!!

The "Grass-crop" Manager

To be an effective manager of "grass-crop" production — man must be a balanced agriculturalist — understanding soil fertility, pasture species, climate, cash-crops and livestock. His dual-purpose in grass-production is to provide food for livestock and fertility for limited grain-growing.

He must understand his environment and that *grassland* is simply a stage of ecological succession. In Britain, pasture is the natural successor to the *arable* phase, then follows domination by such plants as tall-grasses, heather, rushes, bracken and other roughage. The next stage of the natural reversion is *low-forest* and then follows *high-forest* — the natural climax.

Controlling this situation reduces most landowners to fighting a running battle with "nature". But a skilled grass-crop manager works cleverly to maintain his acreage, at a level of productivity superior to all other phases of the natural succession.

Classification Of Grassland

Grasslands may be conveniently divided into two categories — *CULTIVATED* and *UNCULTIVATED.* The latter, in Britain, comprises hill-grazing and other rough areas, all easily identified by the plant species they support and by the proportions in which they co-exist. Dwarf forms of white clover, birdsfoot, trefoil, with bent and fescue, usually make up the best rough grazing.

Two or three less productive divisions can be made, each one graduated towards rougher and coarser predominating species. These progress from those already mentioned through reedgrass, oatgrass, sedges, brome, heather, mosses, bracken, bilberry and rushes.

On the other hand — *cultivated* grass divides into two types: *LEYS* and *PERMANENT* grassland. Ley is a term that refers to seed mixtures sown after cultivation. An area sown for a period of less than four years, before turning it back into arable, is termed a *SHORT LEY. LONG LEYS* are areas treated in a similar way, but left under pasture from four to fifteen years.

Why Are Leys More Productive?

The term PERMANENT GRASSLAND is applied to leys of more than ten to fifteen years and also areas *never* sown under cultivation. It is generally assumed that leys are *FAR* more productive than permanent grass. This is one reason why many pasture "experts" advocate taking "the plough" over the whole farm every few years! Most of them believe that ley-farming produces more grass and some even admit healthier grain-crops too!

The latter is undoubtedly *true!* (The pity is that more don't believe it, in this age of grain monoculture.) And who would dispute the wisdom of using the grain-crop to periodically cash-in on accumulated grassland fertility!

But why should *leys* be more productive grass-wise? We would suggest that ley production is superior to permanent grassland *only* because the latter suffers from inferior management. Leys are usually more heavily dressed with fertilizer and often contain more legumes than the average permanent pasture. But the vital difference appears to lie in the *weakness* of grassland management, rather than in the strength of ley productivity!!

This conclusion is supported by one authority who states:

> "On soils of extremely high natural fertility and where knowledgeable management has been applied, the ley may look like, and also behave as a ley over a whole period of several decades. For example, some of the most renowned cattle-feeding pastures in ... Leicestershire have been down to grass for a matter of sixty to seventy years and still

retain the general attributes of a young ley." (*The Grass Crop,* by William Davies, p. 56).

What *are* "the general attributes of a young ley"? They are high-level production of *quality* feed over an *extended* growing season. And there will be no ingress of weed-types or "mat" formation, normally associated with old grassland.

The same author continues elsewhere:

> "Many of the superb old pastures of Leicestershire and of the Romney Marsh will have been down to grass for sixty or more years and, in fact, may never have been explicitly sown out to grass" (*ibid.,* p. 74).

These top-quality *permanent pastures* are based on white clover and perennial ryegrass and apparently PRODUCE AS MUCH AS ANY LEY!!

Substitute Skill For Leys!

We must surely revise our ideas on the relative merits of *leys* and permanent grass. If well-managed permanent grass can be as productive as the expensive short-term ley, then perhaps we don't have to regularly put "the plough" over the whole farm!

Less grain crops, fewer leys and more permanent pasture would encourage every farmer to *study grassland management!* Are many short-term leys not an expensive cover-up for ignorance or mistakes in permanent grass management and therefore a substitute for *SKILL?*

Grain vs. Grass!

If grass is better than grain for animals, then much of the world's grainland could profitably be turned back to pasture. It would take time to re-build the lost soil fertility that grain-men are going to have to re-build anyway. But they would face it more willingly if they understood that quality grass is better for animals and for their land too!

Grain-feeding is not the problem, but rather the amount fed, and high grain-feeding has been in vogue for so long and is so wide-spread in America that one author writes:

> "The relation between good grass and beef is becoming clear to farmers and ranchers who in the last five or six years have discovered that finished beef can be produced on grass." (*Grasses & Grassland Farming,* by H.W. Staten, p. 13, 1952).

This *"discovery"* must have been a fairly well-kept secret — because grain feeding has *increased!* Britain too is now not far behind America. If grain is plentiful, that's what men will feed, regardless of whether you like to eat sick animals that have made it to the slaughter-house just in time!! Years have now been spent researching liver breakdown in cattle, but the problem would end if only the farmer would grow *more* GRASS and *less* GRAIN!

Is Animal Protein A Luxury?

Added to the grass/grain issue is a new "school of thought". Because of famine and the population explosion, men in high places now seriously question all animal feeding! To them, animal protein is a Western *luxury* that we must do without.

Experts make out a convincing case against domestic ruminants, (specified for man by God). Animals, it is said, are so *"inefficient"* at turning plants into animal protein that millions more people could live if we all become *vegetarians!* Many say the world will soon not tolerate funnelling precious plants into beef and mutton production.

Who can disagree? There *is* an answer and to say the least — in a world in which FAO has just spent SIX YEARS and SIX MILLION DOLLARS on its *Indicative World Plan* to prevent famine — the point is of more than academic importance!

Plant foods in a *top-quality* pasture can be re-cycled back through the soil at a faster rate by animals than by any common agricultural CROP!!

> "If we think of the unit of plant food in such a habitat, that unit would proceed from soil through plant and animal and back again to soil within a period of perhaps a very few *days* and, at most, a period of weeks.
>
> "By contrast, if that same unit of plant food were taken up by a cereal crop and passed into the animal fed indoors, it would find its way into the dung and would, in fact, have taken at least *12 months* to complete a cycle from soil back to soil. In contrast again, that same unit of plant food on poor and under-stocked grass where roughage accumulates year after year, might take *many a year* to complete its full cycle . . . The high-quality grazing ley, therefore, makes it possible that . . . plant food is used to the maximum . . . much as in business, a quick turnover" (*ibid.,* p. 170). [Emphasis ours]

This system with such a potentially rapid turn-around of plant nutrients is the one that technological MAN has, in his ignorance, labelled *"INEFFICIENT"*. If he kept God's Sabbatical Year and understood its importance, he would then know *why* animals have been so designed!

Man has missed the point. Animals were deliberately designed *"inefficient"*. They were meant to return most of their food intake direct to the soil, because it is on this very fact that

all agricultural soil fertility depends! The increase in fertility that can occur in land turned from GRAIN to GRASS production is a direct measure of this "inefficiency".

Applying this principle world-wide would do far more to prevent famine than anything man has yet planned! Just take Britain as an example — any country with an import bill for half of its food and one million in the dole-queue might ease two burdens at once, by assisting some back in the direction of agriculture!

Ridiculous? Most would say so because we are told farmers already have insufficient acreage. But if top quality GRASS is the basis of sound agriculture, the following statistics bear thinking about: 1966 — ARABLE LAND — 18 million acres. PERMANENT GRASS — 12 million acres. *ROUGH GRAZING* — 17 million acres. (*Encyc. Britt.,* 1970)

Out of 47 million acres of agricultural land, 12 million might be ample for ARABLE farming — leaving a *minimum* of 20 to 30 *million acres* for development into first and second grade pastures! Figures for 1938 show that only 1.6% of Britain's permanent grass, even excluding rough grazings, was first class. (*The Grass Crop,* by W. Davies, p. 70)

We live in a world that believes "ANY FOOL CAN FARM" — but this is as contemptuous of the design in God's earthly ecological complex as thinking that any fool can conduct a full symphony orchestra! It now seems as though prior to contact with God's Work we were agriculturally "barely able to read music" — let alone conduct "the grassland symphony".

We hope that The Department of Agriculture and Environmental Research at Ambassador College is now at least learning the "SCORE".

Imagine the future when the whole earth is re-grassed and under the control of multiple millions of men correctly trained in environmental management!

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