

## Grasses and Forage Plants.

### Laying Down Land to Pasture.

We are indebted to the *Mark Lane Express* for a short catechism on grass farming, which every one engaged in tilling the soil would do well to get by heart. At a recent monthly meeting of the Shropshire Chamber of Agriculture, a list of questions framed by the Royal Agricultural Society of England was introduced, and answers furnished thereto by Mr. Henry Brown, of Preston. We bespeak a careful study of this catechism:

1. What is the acreage of your farm?—99 acres.
2. Is it your own property, or do you rent it? If the latter, do you hold on lease, or from year to year? And have you Tenant-Right?—12 acres only my own; the remaining part rented from year to year to Tenant-Right.
3. What is the nature of the soil and subsoil?—Sand, gravel, peat, clay.
4. What is the average rainfall in your district?—Very light; I should think not more than 25 inches.
5. In what year did you begin to lay down land to permanent grass?—1851.
6. What were, at that time, the proportions of your farm in arable land?—66 acres. Permanent pasture 33 acres.
7. What breadth of arable land (if any) have you, since the above date, laid down as permanent grass?—The whole of my farm I have now under grass.
8. In changing your system of management, were you influenced by the high price of fat and lean stock, by the increased and increasing cost of agricultural labor, or by other, and what circumstances?—Purely by the increased cost and difficulty of agricultural labor upon a small farm.
9. Besides distance from the homestead, and water supply, what other conditions (as quality of soil, value, aspect, &c.) guided you in selecting your fields for permanent grass?—In the outset difficulty in working thin-skinned land with uncertainty of crops.
10. Having made choice of your ground, with what kind of cultivation and crops, say in the two preceding years, did you prepare the soil for the reception of the permanent seeds? (If you have tried different methods, kindly state which you have found to answer best, as this is very important).—Turnips followed with barley or oats. Both sown thin, say from 5 to 6 pecks per acre.
11. Does your experience teach you that land should or should not be made as dry (I mean by underground drainage) for grazing as for arable purposes?—Decidedly not so dry, particularly open subsoils.
12. Your land being ready for seeding, in what month have you generally sown the permanent grasses and clovers? Did you sow the light and heavy seeds separately, and what mixtures have you used with most success?—In April the light and heavy seeds generally sown together. The mixture of grass seeds I have not found of so much consequence as a high condition of land. I have always tried to get my land in a high state of cultivation before laying it down to grass; and not only so, but have found it even profitable to dose it well every year for the first four or five years, which compels nature as it were to produce grasses that are indigenous to the soil. In this consists the secret of the whole business.
13. Do you recommend that the permanent seeds be sown with or without a grain crop which shall be allowed to ripen? with or without a sprinkling of rye or rape, or some similar crop, to be eaten green?—With a grain crop allowed to ripen, sown thin, thereby lessening the probability of its lodging.
14. In laying down land to grass, have you practised the system generally known as "inoculation"? If so, please describe the process adopted, and state the cost?—No.
15. What have you found to be the best mode of treating (including manuring) the young seeds, say during the first two or three seasons? Would you mow in any year? or would you depasture with cattle or sheep?—Always one or two dressings of well-made farm-yard manure. I should prefer depasturing with cattle, but in a great measure should be guided by seasons. If a moist season I should prefer depasturing with sheep, or even to mow; but if the latter, a most liberal dressing of manure will be required. I think it of the utmost importance to avoid as much as possible treading and poaching of the surface for the first two or three years.
16. Have you found that this altered mode of farming pays you better than your former practice? and can you give in figures a tabulated comparison of the two systems, including the saving in manual labor and horse-keep?—Having only just finished putting the whole of my farm under grass I cannot answer the question as to pay, but so far as I can at present judge the result will be satisfactory.
17. What alteration (if any) in the number of breeding store, and feeding animals kept on the farm has been the result of laying down this land to permanent grass?—Two-thirds more cattle; principally feeding.
18. Do you find that the number of stock kept on the farm is being increased or diminished as the recently laid down grass acquires greater maturity?—Much increased. For reasons given in the latter part of answers to question twelve.
19. What aid (if any) have you received from your landlord (if you have one) in laying down your permanent pasture? and what conditions (if any) accompanied that aid?—None.
20. Judging from the results of your own experience, what description and quality of land do you consider pays best to lay down to grass in your district? and what soils would you prefer to keep under arable cultivation?—Clays. The more open soils for arable culture.

The Improvement of Permanent Grass.—1. What means have you adopted to improve the already permanent grass existing on your farm, but not laid down by you, viz., by the application of manures, or the consumption of roots or artificial food on the land?—I have given heavy dressings with prepared bone manures and farmyard manure, and also a liberal consumption of linseed corn and decorticated cotton cake.

2. What effect has the application of farmyard manure (if any) to your grass land on the system as manuring your arable land?—Greater outlay in artificial manures.

3. Do you mow any portion of your grass land in any year; and if so, how often, or do you entirely depasture, and if so, with cattle or sheep?—A small extent of peat grass land mow each year, the remainder entirely depastured with cattle.

4. Have you found that to improve your grass land makes it pay you better than before? and can you give in figures a tabulated comparison of the two systems?—My first application of prepared bones gave an increase of 27 per cent. in butter. I was then dairying.

5. What alteration, if any, in the number of stock kept on the farm has been the result of this improvement of your grass land?—I kept 25 head of cattle when my farm was one-third under grass. I have already reached 70, and confidently expect to increase to 90.

### Fat in Forage Plants.

The *Scientific American* makes the following statements, which are well worthy the attention of stockmen and farmers generally, showing as they do the value of the grasses as fat-forming food both in a green and dry state:

To any one not a chemist or a quadruped, the last place to look for fat would be a hay-mow or a stack of straw, yet it appears from recent investigations that fat is not only an essential constituent of hay, straw, and similar forms of vegetation, but one of considerable economic value.

In the lower leaves of oats in blossom, Arndt found as much as ten per cent. of the dry weight to consist of fat and wax, the latter appearing as the bluish bloom so conspicuous on the leaves of luxuriant cereals. In fodder crops, generally, the greatest portion of fat is found in young and thrifty plants. Thus Way found early meadow grass to contain as much as six and a half per cent. of fat; while in that of the same meadow, collected in the latter part of June, there was but a little more than two per cent. The proportion of fat is increased by nitrogenous manures; the grass of a sewage meadow at Rugby contained above four per cent. of fat, while similar grass, not sewage, afforded less than three per cent. of fat.

The nature of this sort of vegetable fat was investigated some little time ago by the German chemist, König, who found that by treatment with strong alcohol, the fat of grass and clover hay could be separated into two parts, one a solid waxy substance, the other a fluid fat, soluble in alcohol. At first he considered the latter to be a true glycerine, but changed his mind after the investigations of Schultz, who proved that though it contains the same proportion of carbon and hydrogen as ordinary fat, the fluid fat of hay is something quite different, since no glycerine can be obtained from it.

König has since confirmed these results and carried forward the investigation, showing that the fat of oats, rye and vetch seed is similarly constituted. In all these forms of vegetation, hay, oat straw, the grain of oats, rye, vetches, and possibly others, he finds oleic and palmitic acids, not combined with glycerine, but in a free state; and as these acids in their combinations are well known as large ingredients of nutritive fats and oils, it is likely that they have a considerable influence on the value of these plants for fodder.

König also finds in hay and in oat straw the important ingredient of animal bile, *cholesterin*; still further, cerotic acid, a waxy body, which forms twenty-two per cent. of ordinary beeswax; and two fatty substances new to science, one fluid, the other solid. They are distinct compounds, having the character of fatty alcohols. Another interesting discovery in hay fat is the presence of a hydro-carbon, the relations of which are not fully made out. In several respects, it agrees with some of the paraffines.

### Grass for Poor Land.

A correspondent wishes to be informed what kind of grass to sow on poor soil, so as to support stock sufficient to till the land, make beef and butter, and provide a supply of manure, so that the farm shall not grow poorer year after year.

It is difficult to answer such a question properly without fuller information concerning the nature of the soil and the general condition of the farm. Clover, vetches, rye, rape,

or kohl rabi, grown with the aid of artificials and fed off by sheep, will put poor land into a state fit for a root crop, after which it may be sown to grain of some kind, and laid down to grass. Or, little by little, the farm may be brought up to a higher pitch of fertility by liberal manuring, and then seeded down. Clover is a valuable restorative on soils where it will flourish, and may be eaten off by sheep or ploughed under as a green manure with the best results. A farmer who has poor land to operate on, should not be in too great haste to raise beef. Let him be content to raise mutton for a time, and employ a flock of sheep in manuring the place bit by bit, until the whole is enriched. A farmer so situated should carefully avoid selling away any of the hay or straw produced. Feed it all to stock. As far as possible too consume the grain on the farm. The crops should be made walk to market by transforming them into mutton, beef and pork.

When land is in a fit state to be laid down to grass, the varieties to be sown must be determined by the nature of the soil, and the use to be made of the field, whether it is to be pastured or mowed. If it is meant for pasturage, a miscellany of grasses should be chosen, from the earliest to the latest in their seasons of springing and ripening, that so a succession of fresh and tender herbage may be provided for the grazing stock. If meadow is wanted, a few grasses that ripen simultaneously should be sown together, and all cut while full of juice, and before going to seed.

Neglect of manuring land laid down to grass, is the great source of impoverishment. Too many farmers fail to regard hay as a crop. They look upon it as a kind of natural, spontaneous product, requiring no particular attention. But hay is a crop as truly as any other, and takes out of the land elements of fertility that must be given back to it in some way, or the soil will keep growing poorer. To mow a piece of land year after year, and apply no manure of any kind, is one of the surest methods of exhaustion that can be tried. And yet is any practice more common than this?

An exchange tells the story of a Mr. Gifford who bought a farm in 1844, which had been mostly laid down to grass, and treated in the manner just alluded to, until it was almost valueless, the yield had become so small. Finding it impossible to make both ends meet on such a place, he grew discouraged and was on the point of giving up. While trying to find a purchaser for his worn-out farm, he encountered a gentleman who had spent a considerable time in Europe, and who advised him to try the following plan of fertilization:

Spread four loads of common barn-yard manure on the meadows every year, and on alternated years, one bushel of plaster to the acre. Mr. Gifford adopted this suggestion, and has practically acted upon it ever since. The result has been that his grass crops have steadily increased year by year, until in a good season, three tons to the acre is by no means a rare crop. In one instance, he cut nearly twenty-eight tons of grass from seven acres of land. A trial of thirty years induces him to believe that he has solved one of the most difficult of agricultural problems. He keeps up the vigour of his grass lands. His plan is, to get out the manure in March. He saves all the labor and expense of composting, by applying the manure in a green state, leaving it to the action of plaster and moisture, to rot it into the soil. Under this method there is a constant and apparently spontaneous growth of clover in many parts of his farm, and without the trouble of breaking up and re-seeding every few years, his meadows continue luxuriant and productive.

JUNE GRASS at the North is the blue grass of the limestone region of Kentucky, modified very little by climate. It is the very best, most permanent and nutritious of the perennial grasses. It soon runs out the timothy sown with clover seed, and supplies its place. Like clover, it delights only in a lime-stone soil, but on such a soil, if top-dressed in winter with stable dung, it will yield, both with and without clover, a heavy hay crop. It is very early and hardy, with a light stem and profusion of narrow leaves, forming the best, earliest, and most permanent pasturage and hay crop. As it grows vigorously in a low temperature it is invaluable for early pasturage.

Dairy farmers say that the curd made from cows' milk fed on this grass changes more rapidly into rich cheese than that obtained from other grasses. There is no species of the pea so productive on calcareous soil. It covers the surface like a mat, and if top-dressed, sends up fresh stems from its roots, making a larger forage crop than three years' old timothy can give.—*Cor. N. Y. World.*