

operations, preferably with the seed-barrow. A bush-harrow is passed over the ground, and the whole should then be rolled twice in opposite directions. The time of sowing in spring varies from March to May, and of these months April will be found the most favourable. It is often possible to get the sowing done hastily in time for a shower of rain which seems to be impending, and to do so is worthy of a special effort. Late sowing is to be condemned, especially on those heavy soils which are liable to crack; and it is a good rule to get all the pasture seeds in well before the middle of May.

The question of a protecting crop of corn is one on which much difference of opinion exists; and it may be well to briefly discuss the arguments advanced for and against the practice of sowing with corn. Undoubtedly a thin crop of some cereal helps to keep weeds in check, and to prevent the young grasses from drought, when they might otherwise be scorched up; but it is equally true that annual weeds are kept down best by constant mowing, which is impracticable unless the seeds are sown alone. Then, too, a laid crop is apt to kill the grass outright, though this danger can be obviated by sowing the corn very thinly indeed. It is just one of those questions which everyone must settle for himself, though we prefer to sow with a cereal, excepting in the case of parks or other ornamental grounds. On lightish lands only barley and oats are available, but wheat can be used on heavier soils. If it is intended to sow grass seeds, the corn is best broadcasted, as the young plants will cover more of the surface of the ground than if it were drilled; and the grass seeds may be got in when autumn sown corn is about two inches high, or spring has just been sown. The corn will naturally take a good deal out of the ground; and a liberal dressing of good, cake-fed manure must be given when it has been carried, by way of compensation.

There appears to be some doubt as to whether it is possible to convert detrital clover and sanfon leys into permanent pastures by seeding them down with strong growing grasses, but we have repeatedly seen good results attained with proper mixtures. (1). To sow the smaller and more delicate grasses would be sheer waste of good seed. Severe harrowing in autumn, a heavy top-dressing of good manure or compost in winter, and the sowing of the strongest growing grasses only are the best means to ensure a profitable plant under such circumstances. If the pasture seed have been sown alone, the young grasses should be topped with a scythe when they are a few inches high; and a heavy roller should immediately afterwards be passed over the land. Generally speaking, the oftener a young pasture is mowed and rolled, so much the better will it succeed. Though mowing will keep annual weeds in check, it does not destroy thistles, docks, and similar weeds, which must be cut with a spud. By about the middle of May it will be seen whether the seeds have taken or not, and in the latter case the land must at once be lightly ploughed and resown. If only a few bare patches are to be found, they can easily be broken up with a hoe, preparatory to raking, sowing, and rolling. The same method must be adopted where corn is grown also, saving that, beyond spudding out thistles, etc., nothing can be done until

(1). We have tried it and never succeeded.—Ed.

the corn be carried. It not infrequently happens that a promising pasture is much injured by allowing stock to graze it too soon, with the result that they pick out those grasses and clovers which are most palatable, and leave the remainder to seed and grow into great tufts. This can to an extent be remedied with a scythe, but it is quite soon enough to put cattle or sheep on to a young pasture the year after sowing. Indeed we prefer to take a lay crop before doing so. (1).

As regards the selection of seeds, it is best in most cases to leave the choice to the seedsmen, whose extended experience in laying down all kinds of land to pasture is almost indispensable for the best results. Under any circumstances nothing but the finest produce of the season should be sown; and those houses, which do not give guarantees of purity and germination, should be altogether avoided.

CARE OF ESTABLISHED PASTURES.

EXTIRPATION OF WEEDS.

While annual weeds can be eradicated by frequent mowing, which prevents the maturing of seeds, and surface rooting perennials, such as creeping buttercup (*Ranunculus repens*), can be torn up with a short-tooth harrow, such deeply penetrating species as thistles, docks, etc., must if possible be removed with a spud or two-pronged lever. Hand-weeding is, however, only effectual if undertaken early and while the noxious plants are confined to local spots. When labour is not available for hand-pulling, the weeds must be cut when in full flower, the process being repeated two or three times until the plants are exhausted and destroyed; but in such cases the seeds of better grasses must be scattered over the pasture in early autumn. If a pasture has once become foul with the seeds and roots of perennial weeds, no remedy remains but that of breaking it up and taking a course of cleansing crops before returning the land to grass. The surest method of overcoming weeds is to ameliorate the physical condition of the land by thorough drainage, ploughing, and liberal applications of suitable fertilisers, especially of super-phosphate. It is, of course, imperatively necessary to collect and burn all fragments of couch and couch-like roots after ploughing. In many pastures the greater portion of the herbage consists of more or less inferior grasses, and it is obvious that these pastures would be still more valuable if these inferior species were replaced by others which would supply a larger amount of favourite food. To accomplish this the inferior grasses should be prevented from seedling by a scythe or mowing machine being passed over them when they are in flower. Seeds of the better varieties being sown afterwards in early autumn.

GRAZING.

Not only must the improvement of stock be considered, but it is most important to maintain or increase the fertility of the land by stocking it with cake-fed animals or otherwise manuring it. Waste can only be prevented by allowing sheep, as well as cattle or

(1). We prefer feeding off, not too close, with young cattle; but neither sheep nor horses should be admitted for, at any rate, the first year.—Ed.

horses, to graze the pasture, because the first mentioned bite down the "bottom grass" more closely than horses, while horned stock chiefly gather the taller herbage. Thus, by properly proportioning the animals and regularly moving them, the pasture can be fed off evenly, and wholesome changes of diet may be provided. The date at which grazing can be safely commenced in spring varies with the season; but cattle should not be turned out until the grasses have made a fair start, and until the ground is sufficiently firm to prevent treading injuring the young shoots; though by too great delay a portion of the fodder, growing hard and unpalatable, may be rejected by stock. It is specially important to keep sheep off grass which is just starting into growth, since they eat some plants so closely as to occasionally destroy them altogether; besides which, their peculiar snatching method of feeding is responsible for the uprooting of many young grasses. Of course those pastures in which early species predominate, will be for grazing first. Pastures should be eaten down before winter; but the time at which stock should be taken off land depends entirely upon the season, and should be so regulated that the autumn grazing does not interfere with the spring pasturage. If any of the larger grasses be permitted to grow into rank, unsightly tufts, by neglect in spreading droppings, animals usually reject the herbage, as they do the hard flower stems of various species. In either case copious seedlings can only be prevented by running the scythe or mower over the pasture, after which the young produce will be readily eaten. All coarse tufts must be cut in December. As the value of the droppings of stock will be discussed fully in our next issue, we need here merely point out the necessity of frequently spreading them evenly over the surface of the pasture to prevent the production of coarse tufts of herbage which are passed over by animals, and have consequently to be cut with the scythe.

HAY-MAKING.

Since the "bottom herbage" is always thicker than the top in a good meadow, it is most important to get the mowing machine as low as possible; and this can only be safely done when stones have been picked off the land early in spring. Not only do most pasture plants become hard and depreciate in nutritive value and digestibility with age, but the ripening of seed weakens them, and seriously lessens their aftermath. Indeed, if some of the less robust grasses be allowed to mature seedlings while young, for several years in succession when thoroughly established, they disappear altogether from the land, leaving gaps to be filled with worthless and, possibly, noxious indigenous herbage. Hence the crop, especially in the case of young pastures, should be cut before the earliest species have formed seeds, even though the produce is liable to shrink proportionately slightly more than would that of older growth. The usual method of drying hay is to spread it out in the sun as soon as it is cut. On the following day it is turned once or more, and at night is made into cocks, to be spread out next morning when the dew has evaporated. As dew is most injurious, it is, however, a much better plan to make it into cocks the first night as well. In favourable weather the tedding-machine may be used freely the second day for ordinary meadow hay; and crops which are not very heavy, or

do not contain large proportions of leguminous plants, can generally be carried during the evening of the third day. In period of continued wet, the grass must be left as cut unless it is made into silage. The leaves of clovers and other leguminous species are brittle, and break off very easily, and the produce of such plants should be carefully turned by hand in the swathe as little as absolutely necessary. There is always a risk of injurious heating in the rick if succulent grasses or clover be carried before sufficient moisture has evaporated. An excellent method of testing their dryness is to twist a few stems into a rope, when—if moisture exudes—the crop is not yet fit to carry. As rain washes a large amount of nutriment out of the plants (Wolf states that cold water passed through clover-may extracts from twenty-five to forty per cent. of the dry substance), partially dried hay should always be made into compact cocks if rain be feared, because less water has access to it thus. When heated cocks are spread out in fine weather, the hay dries very rapidly. While greenness is justly regarded as an indication of well-made hay, it is sometimes desirable to make clovers into brown hay to obviate the necessity of frequent turning and consequent loss of leaf. The plants, being turned only once during the period, are dried in the sun until about two-fifths of the contained water is evaporated; and are then made into large cocks, the heating of which completes the process of drying in five or six weeks. To prevent loss, red clover and lucerne are sometimes cut with a scythe; and, after lying for two or three days in the swathe, are made into small sheaves, the driest plants being placed in the centre. These sheaves are bound with strong flower-culms at the top, and are formed into stooks, the cut ends resting on the ground, so that free access of air beneath is possible. A few days complete the process of drying. If the stooks are overturned by wind, they must be set up again at once.

R. L. NICHOLAS.

THE COST OF ENGLISH COUNTRY HOUSES.

One of the most interesting articles I have read for a long time is that which Mr. Cornish contributes to the April "Cornhill," on "The Cost of Country Houses." He gives a mass of information which I heartily wish I had had at my fingers' ends when I was writing "The Splendid Paupers," a book which, by-the-by, oddly enough, seems to have met with much greater vogue in Germany than in this country. Only the other day I received an intimation that it was appearing again as a feuilleton in several German newspapers under the title of "The Yellow Man." This, however, by the way.

THE NUMBER OF COUNTRY HOUSES.

Mr. Cornish calculates that there are 300 country houses, in addition to the royal palaces in England as well as in Scotland. Of these, 640 belong to the third category, which consists of those worked by a minimum staff of 50 men. There are 200 of the second magnitude employing from 50 to 170 men. There are 60 of the first magnitude who maintain from 200 to more than 600 men in the performance of work other than industrial or agricultural, in the employ-