

## Grasses and Forage Plants.

### LUCERNE.

Lucerne, if properly cultivated, in a soil and locality well adapted for its proper development, is one of the best and most profitable of green fodder plants; indeed it may be considered supreme among the artificial grasses. Lucerne was well known in the early days of Roman husbandry, and the writers of that period speak of it in terms of the highest encomium. Columella especially praises it and estimates it as the choicest fodder, lasting many years as a crop, and susceptible of being cut down advantageously four, five and even six times each year. He also asserts that it is a crop positively enriching to the soil producing it, exceedingly fattening to depasturing animals, and not unfrequently a valuable remedy in cases of sick beasts. He also tells us that "a measure of land (equal to about three fourth of an imperial acre) was considered amply sufficient for the sustenance of three horses during an entire year." Palladius gives similar testimony, and Pliny, whilst agreeing as to the frequency with which the Lucerne crop may be mown in the course of the season, differs from them in his estimate of its permanency.

Lucerne belongs to the order Leguminosae, and of the genus *Medicago*, of which although there are several species, only two have entered into English cultivation. The most important of these is the *Medicago Sativa*—common Lucerne—an erect growing perennial plant, with roots penetrating to a great depth in suitable soils. The flowers grow in clusters and of a purplish blue color when the plant reaches a height of about three feet, which it does in England in June and July. Under favorable circumstances, the resultant produce is very great, and owing to the perennial habit of the plant, the annual outlay for labor is much reduced. It is considered injudicious to cut the crop during the first year; a good bulky crop may fairly be gathered during the second year, but full maturity is not reached till the third year, and a vigorous growth may be calculated on for some six or seven years more, when the roots become symptomatic of decay, and the plant declines in vigor.

*Medicago Lupulina*—Yellow Clover or Nonsuch—is frequently, in England, mixed in small quantities with clover and other seeds in laying down artificial grasses. It is a great seed producer, and consequently cheaper than those of any of the clovers, and this fact may possibly account for its popularity with many English farmers, as although its produce is bulky, cattle are no great lovers of it, either in a green or dry state, and prefer it mixed with more palatable varieties of fodder.

#### Suitable Soils

Lucerne delights in soils of a deep dry nature in which its tap-root can descend without check to the subsoil and draw its requisite supplies of food and moisture. Of this character are vegetable moulds, light and friable loams and even gravels. Alluvial deposits on a sandy substratum are also well adapted for the crop. Clays and strong clay-loams are unsuitable for its proper development, as being too compact in their character to admit of that free penetration of the roots which Lucerne loves to display, not to mention the liability of such soils to an excess of moisture and consequent low temperature, of both of which it has an especial dislike. We must not however be understood as entirely discouraging the cultivation of Lucerne on clay lands, for it has not unfrequently been found that even on them large crops have been obtained; we would merely indicate that the lighter class of soils possesses preferential claims to its successful cultivation. As in the case of all the leguminous plants, Lucerne cannot thrive without a proper supply of lime in the soil, and this will be

fitly illustrated by examining the following analysis of Lucerne ashes by Sprengel:

Potash .....	14.03
Soda .....	6.44
Lime .....	50.57
Magnesia .....	3.64
Oxide of Iron, Alumina, &c. ....	0.63
Phosphoric Acid .....	13.68
Sulphuric Acid .....	4.32
Chlorine .....	3.23
Silica .....	3.46
	100.00

Lucerne can hardly be called a rotation crop, inasmuch as its permanency of habit gives it a distinguishing feature from the other forage crops, and indeed gives it a distinctive value, as it continues to be a productive crop during the entire period of our longest rotation. It is usually grown for its own intrinsic value as a crop yielding luxuriant returns to the grower, receiving peculiar special treatment according to the object for which it is cultivated.

#### Preparation of the Land.

In preparing the land for the reception of Lucerne it is a matter of urgent primary importance that it be thoroughly cleansed from weeds, whether annual or otherwise, as after the lucerne seed is sown it becomes almost an impossibility to extirpate weeds, which will speedily become formidable rivals to the cultivated plants, and ultimately acquire such a preponderance over them, as to greatly diminish their produce. Where sub-soiling is practicable, the use of the sub-soil plough is strongly recommended in order to afford greater facility for the rapid penetration of the roots of the lucerne plants, which have been discovered at a depth of four feet from the surface. The surface soil should be brought into the finest condition of tilth, so that the seed when sown may not be covered too deeply for successful vegetation. Manure is likewise an indispensable necessity for anything like a return equal to the capabilities in this respect, of lucerne; the proportion to be employed, being of course discretionary with the farmer, according to the nature and condition of the soil, bearing always in mind that much of the subsequent productiveness of the crop is largely dependent upon the liberal treatment received in the earlier stages of its growth. If these be favorable, the plant gets well rooted before the winter sets in, and in the following spring is ready to make a vigorous growth; on the other hand, if the land is not in good tillage heart, the plants will be thin and stunted, making themselves an easy prey to the severity of winter, which if they do survive, will likely render them weak and sickly, and struggling arduously for very existence. No better manure can be applied than ordinary farm-yard dung, which may be applied, either in its rotted or green state, either in autumn or spring, always remembering to make due allowance for the proportions requisite, when applied in these two different conditions, and also, that dung, in its green state is less immediately available as a fertilizer, than when it is well rotted. Gypsum may also very advantageously be used as a manurial application.

#### Quantity of Seed.

Care is requisite in the selection of seed, and it is most important that it should be well matured and quite fresh; even the second year a considerable percentage refuses to germinate, and renders necessary a larger quantity per acre, to insure a good take. The Dutch and French seeds are considered the best. "The seed is larger in size and paler in color than clover, and should always be plump and of a light appearance. To detect any impurities or adulteration, it is a good plan to take a piece of white paper, moisten the surface, and then lay the seed thinly over it, and carefully examine the sample with a low power magnifying-glass. Any coloring matter that has been used, may then generally be discovered, and the seeds of other plants mixed with it be readily identified." This test is equally applicable to clover seeds. The quantity to be sown per acre, varies according to the mode adopted, for drilling, from seven to ten pounds are sufficient; for broad-casting, about double that quantity, fifteen to twenty pounds are generally used. Drilling, however, is preferable to broad-casting; only half the quantity of seed is required, it is more equally distributed and deposited in the soil, and affords a better opportunity of using the hoe more freely in keeping

down the weeds, especially in the early stages of the growth of the plant. Lucerne is, now-a-days, generally sown by itself as a distinct crop, although it was the old practice to sow it down with a straw crop, and thus obtain a return from the field during the unproductive period of the lucerne crop. Whilst this plan, especially on light dry soils, has the advantage of shading the young plants from the action of the sun, and at the same time preserving the surface in a more moist condition, yet these advantages would be equally shared by the weeds, from which it is so essential that the young plant should be protected. In such cases too, it is strongly advisable to drill the straw crop at wide intervals, say 12 inches. The lucerne seed, which should be lightly covered, germinates very quickly, usually appearing above ground in seven or eight days. Where grown by itself, and drilled, the rows should not be less than 15 to 18 inches apart. This will admit of the ready application of the hoe in simultaneously stirring the soil and eradicating the weeds. It is advisable not to touch the crop the first year, although if the growth has been vigorous, and the plant strong and healthy, it may be cut late in the season, say the end of August or September, taking care not to cut too close to the ground, leaving two or three inches of stem untouched; but, in no case, should it be depastured by stock. The following spring a vigorous growth may reasonably be expected, and three cuttings in the course of the season may be calculated on; it is not prudent to take more the second year. In succeeding years, however, if due attention be paid to the crop, both as regards tillage and manuring, four, five, and even six cuttings, from 12 to 18 inches high, may be obtained in the course of the season, of a rich and succulent herbage of a highly nutritive character, and greatly relished by all descriptions of cattle. That these results may be obtained, the crop must be kept thoroughly well cleaned, and a generous dressing of manure, either farm-yard, or some tested auxiliary fertilizer, in combination with gypsum, to maintain the condition of the field. The crop reaches its maximum productive power about the fifth year, after which the weeds, even with the greatest care, make formidable headway, so that by the seventh or eighth year its value as a forage crop is so materially decreased that it is ploughed up.

#### Mode of Feeding.

Lucerne should be cut green, and after being exposed for a moderate time to the drying influences of the sun and wind, should be carted to the yards or stables for the cattle or horses. When cut, it should not be left in a heap, as owing to its very succulent nature, the heating process will speedily be set up, and the fodder rendered less palatable to the cattle. Indeed, lucerne has a tendency, under any circumstances, to act as a slight purgative to cattle when first partaken of; it is necessary therefore to give it cautiously at first, increasing the allowance as the animals become used to it. Free access to lucerne might prove disastrous to cattle, as they partake of it with such greediness that "hoven" would almost inevitably follow. If care, however, is exercised, both as to quantity and over-succulence, no great danger need be apprehended. In some countries, lucerne is made into hay, which is much valued for its nutritive qualities. The very greatest care and attention is requisite, not only in the manufacture of lucerne hay, but also in the stacking of it, owing to the presence of an extraordinary amount of moisture in the composition of the plant. Lucerne should be cut before the plant comes into flower; if after, the stalk becomes tough and fibrous. Some persons of skill and experience strongly affirm that lucerne is much superior to clover for soiling milch cows; at any rate, one thing is certain, that it causes a large quantity of milk of good quality, and keeps the cow in good condition and health.

#### Produce per Acre.

The gross produce per acre of green food when the crop is in full bearing, is from 25 to 30 tons, thus return being readily obtained, where the proper conditions to secure success have been observed. Lucerne is cultivated in Canada and the States to a limited extent, but, we know no reason why its more general cultivation should not be entered into. In the neighborhood of large cities, we imagine it would be a peculiarly easy and profitable crop to raise, and we confidently anticipate an increased attention on the part of farmers to the more extended cultivation of this important and valuable forage crop.

The price of Lucerne is from 30 to 40 cts. per lb., varying according to the season.

In the preparation of this article we have been indebted for much information to the exhaustive essay on the subject, by Mr. John Wilson, professor of agriculture, in the university of Edinburgh, Scotland.